

Running head: AN INTEGRATED COMMUNICATION APPROACH

**An Integrated Communication Approach
to Address Zoonotic Diseases**

Elaine DC Llarena

BSc Development Communication (University of the Philippines Los Baños)

MA Communication (University of the Philippines, Diliman)

This thesis is presented for the degree of Doctor of Philosophy at Murdoch University in
2019.

Declaration

I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary institution.

Elaine DC Llarena

Abstract

The research was carried out to help with developing more effective communication processes that are required to deal with the global threat of emerging infectious zoonotic diseases. My study draws on approaches to enhance communication that recognise socio-cultural contexts are fundamental to understanding health risks and biosecurity in Asia. Inter- and transdisciplinary approaches, including One Health and Ecohealth, are important in relation to enhancing communication about diseases that affect the health of humans, animals, and the environment.

The main objective of my research was to propose an integrated communication approach to address zoonotic diseases, that recognised the importance of socio-cultural and institutional characteristics, and acknowledged inter- and transdisciplinary approaches. I used qualitative methods, including ethnography, case studies and a systematic literature analysis.

Through my research, I illustrated the need to recognise socio-cultural and institutional contexts in understanding health risks for effective communication about disease management. I found that in implementing disease mitigation measures there were unique cultural traditions and indigenous norms that were integral to development communication. Effective institutional systems are necessary to support communication strategies and to ensure that the appropriate communication processes are used in disease emergency situations.

My study also provided evidence that there is a need for inter- or transdisciplinary approaches and improved investment in communication to face the complex global threats to health of humans, animals, and the environment.

The outcome of the research was the development of a synergistic, context-based framework for communication about complex zoonotic disease threats that integrates the principles of science, culture, and risk communication in inter- and transdisciplinary approaches. Its adoption will contribute to the improved prevention and control of zoonotic disease threats.

Table of Contents

Declaration.....	ii
Abstract.....	iii
Table of Contents	v
Acknowledgements	xii
Publications and Presentations Resulting from this Research	xv
List of Tables.....	xvii
List of Figures	xviii
List of Abbreviations	xxi
Chapter 1: Introduction.....	1
Background and context	1
Research questions and objectives.....	3
Structure of the thesis.....	5
Scope of the thesis	7
Chapter 2: Zoonotic Emerging Infectious Diseases, and the Need for Multiple Disciplinary Perspectives to Address Health Risks and Biosecurity	8
Introduction.....	8
Part 1: The emergence of zoonotic infectious diseases	9
Globalisation, ‘world risk society’, and the concept of risk in the global health milieu.	9
Emergence of infectious diseases.	12
Zoonotic infectious diseases in Southeast Asia.	15
Influenza viruses.	15
Nipah virus encephalitis.....	20
SARS coronavirus.....	20
Conception and premises of biosecurity.	22
Part 2: Disciplinary approaches in addressing zoonotic emerging infectious diseases.....	24
Multi-, inter-, and trans-disciplinary approaches.....	24
One Health (OH) and Ecohealth (EH) approaches to Zoonoses.....	25
Social and cultural implications of zoonotic emerging infectious diseases in Southeast Asia.....	31
The roles of communication and underlying issues in emerging infectious disease health programmes.....	34
Conclusion	37
Chapter 3: Theoretical Underpinnings and Communication Standpoint	39

Introduction.....	39
Epistemology of Risk.....	40
Theoretical Paradigms on Exploring the Social and Cultural Notion of Risk.....	43
The Social Construction of Reality.....	44
Risk and Culture.	45
Risk Communication	45
Communication standpoint: Asiacentric and development communication	46
Development communication and its applications in addressing animal health risks and biosecurity.	46
Asiacentric communication for understanding the implications of animal health and biosecurity risks.	60
Conclusion	66
Chapter 4: Research Design.....	68
Introduction.....	68
Ethnographic study in Bohol and Benguet	74
Principles of ethnography.	74
Ethnography and the study of health risks and biosecurity.	76
Fieldwork sites, agenda, and data collection.	77
Field data organisation and interpretation.....	82
Researcher stance as an observer and participant in the study.	85
Case study of Singapore SARS outbreak.....	87
Qualitative case study method.	87
Background and characteristics of Singapore's SARS outbreak experience as a case study.....	88
Data gathering procedure: Conduct of key informant interviews and review of published documents as secondary data.	89
Data organisation and interpretation.....	90
Systematic literature review of One Health and Ecohealth	90
Procedure in selection of the literature, inclusion and exclusion criteria, and analysis.....	91
Conclusion	94
Chapter 5: Contextual understanding of health risks and biosecurity:	
An ethnography study of selected sites in the Philippines.....	95
Introduction.....	95
Case study 1: <i>Cañao</i> ritual.....	96
Research interest on <i>Cañao</i>	96
Swine raising by the <i>Igorots</i> , and <i>Cañao</i> of the <i>Ibalays</i>	97
Adivay 2008: <i>Cañao</i> and the cultural program.	99

Simple Cañao.....	100
Grand Cañao	115
Potential health risks and biosecurity in the Cañao ritual.....	122
My reflection and analysis of the <i>Cañao</i> ritual relevant to contextual understanding of health risks and biosecurity.....	126
Sourcing and movement of the pigs used for offering.....	126
Sanitation of the materials used in the rituals	127
Exposure to and handling of the animals	127
Case study 2: Barangay Livestock Aide (BALA) Program of Bohol.....	128
Research interest on Bohol's BALA Program.....	128
Conception and objectives of BALA Program.	131
Mechanics and functions of BALA in the community.	131
Impact of BALA: community engagement, coordination with other institutions, and partnerships as a peoples' organisation.....	135
Involvement of BALA in animal dispersal-livelihood programs	137
Participation of BALA in the Bohol Rabies Prevention and Eradication Program as main proponents of Bantay Rabies sa Barangay	142
Assistance to other programs	145
Challenges in the program implementation and BALA volunteers' experiences.....	146
Political intervention.....	147
Lack of financial or logistical support	147
Inactive BALA volunteers	148
Sustainable approaches of the BALA program.	148
Policy, technical, and logistical support	149
Mentoring community animal health workers in other local government areas	149
Sharing of experiences and best practices to be replicated by other local governments.....	149
My reflection and analysis of the BALA Program relevant to contextual understanding of health risks and biosecurity.....	150
Community accountability and values formation	150
Sound governance to support community awareness and actions on disease prevention and control	151
Reflexivity and feedback exchanges in participation and community engagement	152
Conclusion	153
Chapter 6: Institutional Systems and Communication Approaches When Faced with an Unknown Disease: Battling SARS, the Singapore Way	155

Introduction.....	155
SARS cases in Singapore.....	156
Country profile.....	156
SARS crisis scenario.....	156
Before the SARS outbreak.....	158
A central executive group established to address national crisis	159
Communication management included public understanding on resiliency ..	160
During the height of the SARS outbreak	161
Top guidance from executive group	162
Prompt amendment of the Infectious Diseases Act	163
Various sectors received up-to-date information about SARS from one main source by different means	163
Use of various media platforms and communication approaches	164
Media relations.....	165
Launched resource-sharing and multidisciplinary collaboration initiatives ..	167
Post-SARS lessons and new directions undertaken.....	169
Contingency and business continuity plans were created.....	169
Inter-ministerial and international collaboration were maintained.	171
Recognising the challenge to sustain public interest and consciousness on disease emergency preparedness.	171
Communication principles from the Singapore SARS outbreak experience.....	173
Strong government leadership and policy support advances effective communication.....	174
Dissemination of information and communication management starts from the top-level.	174
Evidence-based approaches, such as the inclusion of research, as part of routine strategies, influence the choice of communication approaches.	174
Public understanding of health risks and biosecurity is necessary to sustain interest.....	175
Multi-sectoral and interdisciplinary collaboration should be established.....	176
Explicit agreements on resource sharing.	176
Instituting communication and good relations among government leaders, policy or decision-makers, science experts or technical specialists, and media practitioners unique to the Singapore government.	176
Conclusion	176
Chapter 7: Investigating Communication in One Health and Ecohealth	179
Introduction.....	179
Description of the assessed articles.....	180
Types of articles, year of publication and geographical focus.....	180

One Health themes of articles and communication discipline involvement of authors.....	187
Analysis of communication aspects in One Health	191
Communication topics and research methodologies.....	191
Communication arguments posited in the literature.	193
Communication facilitates understanding among interdisciplinary One Health professionals, and between them and their stakeholders	193
Communication influences people's behaviour and attitude	194
Communication in media shapes public understanding and opinion.....	195
Dialogue and participation among stakeholders and communities enabled by communication.....	196
Emergent communication discourse in One Health.....	197
One Health messages should balance the interests of an interdisciplinary collaboration.	197
Media engagement and transforming risk messages to 'news value' stories is crucial in One Health communication.	198
One Health communication is a synergistic process.....	199
Conclusion and researcher's insights.....	199
Chapter 8: Discussion and Conclusions	202
Introduction.....	202
Part 1: Discussion of findings	203
Socio-cultural and institutional contexts in understanding health risks and biosecurity to support effective communication.....	203
Socio-cultural contexts and critical pathways of human-animal interaction as potential health risks and biosecurity concern	203
Local institutional arrangements and community values as contexts to support health risk and biosecurity management.....	204
National institutional arrangements that support communication strategies in zoonotic disease emergencies.	205
Communication in interdisciplinary One Health and Ecohealth approaches. ...	206
Part 2: A synergistic context-based communication framework to address zoonotic infectious diseases.....	208
Part 3: Synthesis of key findings	212
Research question 1: What are the socio-cultural and institutional characteristics that contribute to contextual understanding of health risks and biosecurity in Philippine communities?.....	212
Research question 2: What institutional arrangements influence the choice of communication approaches to address zoonotic emerging infectious diseases in disease emergencies, as in the case study of SARS in Singapore?.....	213
Research question 3: What are the emerging issues in communicating health risks and biosecurity in the context of zoonotic diseases?.....	214

Research question 4: What are the emerging gaps for appropriately communicating inter- and transdisciplinary approaches such as OH and EH in the context of addressing zoonotic diseases?	215
Part 4: Significance of the findings and proposed Synergistic Context-based Communication.....	216
Implications for a zoonotic disease program implementation.	216
Implications for communication and interdisciplinary research.....	217
Implications for Development Communication theory and practice.	217
Conclusion	218
References	219
Appendices	249
Appendix A.....	250
Coordination letter sent to the Provincial Veterinarian of Benguet.....	250
Appendix B	251
Interview guide used in the ethnography study in the Philippines	251
Appendix C	252
Sample field notes entry.....	252
Appendix D.....	253
Sample video shot list	253
Appendix E	254
Sample coordination letter sent to the Ministries in Singapore	254
Appendix F.....	255
Interview guide used in the Singapore case study	255
Appendix G.....	256
Copy of the <i>Adivay</i> 2008 - <i>Cañao</i> and Cultural Program.....	256

“I can do all things through Christ who strengthens me”

- Philippians 4: 13, NKJV

Acknowledgements

I would not have had the opportunity to do this research and complete my thesis without the support of various institutions, mentorship of my supervisors, and encouragement by individuals who had made this journey worthwhile. I acknowledge the Partnership Scholarship of Murdoch University (MU) and the Australian Biosecurity-Cooperative Research Centre (ABCRC) for Emerging Infectious Diseases that made this PhD research project possible. My heartfelt gratefulness goes to Professor Emeritus John Edwards, my principal supervisor and former Dean of MU School of Veterinary and Biomedical Sciences, who facilitated the scholarship opportunity. Most of all, I thank him for his unceasing support, mentoring, and believing that I could complete this thesis amidst the personal circumstances I had been through. I also extend my sincere thanks to Dr. Lisa Adams who helped me adjust as an ABCRC international student when I first arrived in Perth, and appreciated my interdisciplinary research from the beginning.

I also extend my sincere gratitude to my other supervisors who mentored me to become a mature interdisciplinary scholar, namely: Dr. Kate Fitch, who provided me with profound guidance throughout my research, and shared with me her expertise in media communication and public relations; Professor Emeritus Garry Rodan former Director of MU Asia Research Centre (ARC), who made me part of the ARC PhD student-fellows group, introduced me to critical analysis from the political science lens that broadened my perspectives in doing my research, and provided valuable comments on my thesis chapter on the Singapore's SARS outbreak case study; Dr. Peta Edwards who gave thoughtful technical comments from a biomedical perspective as well as patiently devoting time to read and edit my

thesis drafts; Dr. Ana Rita Sequeira, who provided insightful guidance on the conception and analysis of the systematic literature review of communication in one health; and, Dr. Anne Surma, who provided guidance from the social sciences in the early phases of my research, and continued to encourage me towards my thesis completion. I also thank the ARC Executive Director Dr. Rikki Kersten and Sia Kozlowski for the Centre's assistance especially during the final stages of my completion.

I am forever grateful to research participants in the communities and staff of the local government offices, who selflessly gave their time and shared valuable field data for my research. I particularly thank the Office of the Provincial Veterinarian of Benguet and Bohol in the Philippines for assisting me in the coordination of my field work. My sincere gratitude also goes to FAORAP, FAO Manila, and Dr. Carolyn Anne Benigno, who provided generous support in the conduct of my field data gathering for the ethnography study.

I acknowledge the support of the University of the Philippines (UP) System through the Office of the Vice President for Academic Affairs (UP-OVPAA) headed by Vice President Dr. Maria Cynthia Rose Bautista for the provision of the Faculty, REPS and Administrative Staff Development Program-PhD Incentive Grant that allowed me to finish my thesis writing in Perth. I also acknowledge the support of my leaders and colleagues in UP Los Baños (UPLB) for allowing me to take study leave to complete my thesis. My sincere gratitude to Chancellor Dr. Fernando Sanchez Jr., Vice Chancellor for Academic Affairs Dr. Portia Lapitan, UPLB College of Development Communication Dean Dr. Maria Stella Tirol, and my colleagues Garry Jay Montemayor, Olga Lomboy, Winifredo Dagli, Rikki Lee Mendiola, and Sarah Mae Coronel. I also acknowledge Hannah Fitch-Rabbit, Tom Littlechild, and

Charlene Mae Arkaina for assistance in the formatting of my thesis manuscript.

I greatly appreciate the collegiality and friendship of several fellow ARC and Veterinary Science PhD students who I worked with during my studies. These were: Dr. Stephanie Chok, Dr. Kah Seng Loh, Dr. Teng Phee Tan, Yuen Ming Phoon, Dr. Luky Djani, Dara Meutia Uning, Vitti Valenzuela, Dr. Jarunee Siengsenan-Lamont, Dr. Jom Acebes, Dr. Jim Caro, Dr. Pebi Purwo Suseno, Dr. Kyaw Naing Oo, Dr. Sothyra Tum, Dr. Polly Smith, Dr. Siti Ramanoon, Dr. Blesilda Verin, Marco Lagman, Jessica Manulong, Howard Lee, Ligia Judith Gia, Lian Sinclair, Brian Guiron, Aaron Alejandro, and Jely Galang.

I thank my family: Angel Jr., my partner, for the inspiration and being patient with me as I complete this journey; my father, and siblings for their relentless encouragement. Lastly, I dedicate this thesis to the memory of my mother, Angelina, who truly made the completion of this journey worth it.

Publications and Presentations Resulting from this Research

- Llarena, E. DC. (2017). *Risk Communication in One Health: The Cultural Context of Cañao Practice in the Cordillera Region*. Oral presentation at 7th National Conference and Scientific Meeting of the Association of Development Communication Educators and Practitioners (ADCEP) Philippines, Inc. on 30 Nov to 3 Dec 2017 at West Visayas State University, Iloilo, Philippines.
- Llarena, E. DC. (2015). Current literature that support the shift to Asiacentric and Development Communication paradigms in dealing with the understanding of animal health risks and biosecurity in Southeast Asia. *The Philippine Journal of Development Communication*, 7 (pp. 1-27).
- Llarena, E., Edwards, J., Surma, A., Fitch, K., & Benigno, C. (2012). Making sense of local knowledge and indigenous practices on health and biosecurity risk management. In Adams L.B., Gray G.D and Murray G. (Eds.). *Animal biosecurity in the Mekong: Future directions for research and development. Proceedings of a workshop held, 10 - 13 August, 2010, Siem Reap, Cambodia. ACIAR Proceedings No. 137*, pp. 90-92. Canberra: Australian Centre for International Agricultural Research.
- Llarena, E., Edwards, J., Rodan, G., Surma, A., Fitch, K., & Benigno, C. (2010). *Towards an integrated communication framework: A study on the crisis and risk communication management in response to zoonotic emerging infectious diseases in Southeast Asia*. Oral presentation at the Australian Biosecurity Cooperative Research Centre (AB CRC) for Emerging Infectious Diseases National Workshop on 11 to 14 May 2010 at Kingfisher Bay Resort, Fraser Island Australia.

- Llarena, E. DC. (2009). *Visual ethnography as a research tool in the study of health biosecurity risks on emerging infectious diseases: A Philippine case experience*. Oral presentation at the 18th AMIC (Asian Media Information and Communication Centre) Annual Conference on 13 to 16 July 2009 at Le Meridien Hotel, New Delhi, India.
- Llarena, E., Edwards, J., Rodan, G., Surma, A., Fitch, K., & Benigno, C. (2009). *An ethnographic study of indigenous knowledge, local practices and traditional beliefs on animal-raising and health management: A Philippine case study*. Oral presentation at the Australian Biosecurity Cooperative Research Centre (AB CRC) for Emerging Infectious Diseases National Workshop on 19 to 21 May 2009 at Holiday Inn Esplanade, Darwin, Australia.
- Llarena, E., Edwards, J., Rodan, G., Surma, A., Fitch, K., & Benigno, C. (2009). *Rapid assessment on the crisis and risk communication management in response to zoonotic emerging infectious diseases in Southeast Asia*. Oral presentation at the Australian Biosecurity Cooperative Research Centre (AB CRC) for Emerging Infectious Diseases National Workshop on 24 to 26 June 2008 at Siam City Hotel, Bangkok, Thailand.
- Professor Aileen Plant Award for best international student oral presentation at the Australian Biosecurity Cooperative Research Centre (AB CRC) for Emerging Infectious Diseases National Workshop on 24 to 26 June 2008 at Siam City Hotel, Bangkok, Thailand.
- Llarena, E., Edwards, J., Rodan, G., Surma, A., Fitch, K., & Benigno, C. (2007). *'React or Relate?' A participatory approach to crisis and risk communication in response to new and emerging diseases in Southeast Asia*. Poster presentation at the Australian Biosecurity Cooperative Research Centre (AB CRC) for Emerging Infectious Diseases National Workshop on 14 to 16 November 2007 at Novotel Hotel, St. Kilda, Melbourne, Australia.

List of Tables

Table 1 Factors contributing to emerging and re-emerging infectious diseases	14
Table 2 Definition of One Health	26
Table 3 The continuum of epistemological approaches to risk in the social sciences	42
Table 4 Nora C. Quebral's (2002, 2006 and 2012) definition of development communication	48
Table 5 The emergence of development communication	51
Table 6 Matrix summary of the methodologies employed in the research	71
Table 7 Summary of field work duration and activities in the provinces of Bohol and Benguet	84
Table 8 List of articles assessed for the systematic literature review	182

List of Figures

Figure 1 Map of the Philippines and the two case provinces	78
Figure 2 Data interpretation and analysis framework of the ethnography study	86
Figure 3 PRISMA flow diagram used for systematic literature review on One Health/ Ecohealth and communication	93
Figure 4 Map of Philippines' Cordillera Autonomous Region (CAR).....	96
Figure 5 Restraining the pig.....	101
Figure 6 Image of the <i>manbunong</i>	101
Figure 7 Men doing the <i>owik</i> or pig slaughtering	102
Figure 8 Image of the <i>uwik</i>	103
Figure 9 The pig was brought to the cooking open area for grilling	103
Figure 10 Men took turns in scraping off the hair from the pig's skin using bamboo planks.....	104
Figure 11 The pig was flipped on all sides to scrape off the hair skin.....	104
Figure 12 Procedure after grilling.....	105
Figure 13 Men scraping off the hair.....	106
Figure 14 Procedure after the hair scrapped off	106
Figure 15 Men exposed to the pig's internal organs	107
Figure 16 Pig's body cut open, and internal organs were taken out	107
Figure 17 Pig meat	108
Figure 18 Men cutting the pig meat into portions of different sizes	108
Figure 19 <i>Manbunong's</i> interpretation	109
Figure 20 Ritual offering.....	111
Figure 21 The ritual of drinking <i>tafey</i>	111
Figure 22 Some of the local women preparing the banquet table	112

Figure 23 The open space cooking area, where the pig meat was grilled and boiled	112
Figure 24 The <i>manbunong</i> doing his ritual chants fronting the set up banquet table for the ceremony	113
Figure 25 The <i>manbunong</i> offering while doing his ritual chants	113
Figure 26 One of the local women giving out the cooked meat to be eaten by the locals and guests	114
Figure 27 The cooked meat shared by everyone in the <i>Cañao</i> ceremony.....	114
Figure 28 The <i>Cañao</i> and Cultural Program	117
Figure 29 Pigs for the <i>Cañao</i> ritual	117
Figure 30 Men were unloading more black-coloured pigs from the truck to the holding pen	118
Figure 31 Preparing for the <i>avang</i>	119
Figure 32 The <i>avang</i> or <i>depap</i>	119
Figure 33 Continuation of the <i>avang</i> during the Grand <i>Cañao</i>	120
Figure 34 The <i>manbunong</i> at the Grand <i>Cañao</i>	120
Figure 35 One of the locals prepared the <i>tafey</i> for the ritual	121
Figure 36 Provincial leaders lead the <i>tayao</i> or ritual dance	121
Figure 37 The <i>owik</i> ritual	122
Figure 38 Scenario tree of animal-human and animal-animal interfaces of potential health and biosecurity risks	124
Figure 39 Map of Bohol Province in Central Visayas, Philippines	130
Figure 40 Functional chart of Bohol's BALA Program	136
Figure 41 Preparing for the POG	138
Figure 42 The Animal Gifts to be handed to recipient-farmers in the POG ceremony	138
Figure 43 Ceremonial POG	139
Figure 44 Receiving the animal gift	139

Figure 45 Response of the farmer	140
Figure 46 The organisational structure of the BRPEP	144
Figure 47 Content discussion of One Health in the articles	187
Figure 48 One Health settings covered in the articles	189
Figure 49 Article authorship from the social science and communication backgrounds	190
Figure 50 Communication topics among the assessed articles	192
Figure 51 Synergistic Context-based Communication Framework	208

List of Abbreviations

AGRIS	International System for Agricultural Science and Technology
AI	Artificial insemination
AIDS	Acquired immunodeficiency syndrome
APA	American Psychological Association
APEC	Asia-Pacific Economic Cooperation
AUD	Australian Dollars
AusAID	Australian Agency for International Development
AVA	Agri-Food and Veterinary Authority
BALA	Barangay Livestock Aide
BRB	<i>Bantay Rabies sa Barangay</i>
BRPEP	Bohol Rabies Prevention and Eradication Program
CAR	Cordillera Administrative Region
CDC	Centers for Disease Control
CONBUSAC-BOAWAS	Confederation of Boholanos, USA and Canada, and Inc-Bohol Association of Washington State
CSF	Classical Swine Fever
Devcom	Development Communication
DOLE	Department of Labor and Employment
ECTAD	Emergency Centre for Transboundary Animal Disease
EG	Executive Group
EH	Ecohealth
EID	Emerging Infectious Disease
FAO	Food and Agriculture Organization of the United Nations
FFS	Farmer field school

FMD	Foot and Mouth Disease
GDP	Gross domestic product
GISRS	Global Influenza Surveillance and Response System
HALI	Health for Animals and Livelihood Improvement
HCEG	Homefront Crisis Executive Group
HIV	Human Immunodeficiency Virus
HMO	Home Quarantine Order
HQ	Headquarters
HPAI	Highly Pathogenic Avian Influenza
IDRC	Canada's International Development Research Centre
IEC	Information, Education and Communication
IT	Information technology
KAP	Knowledge, attitudes, and practices
LGU	Local Government Unit
LIFFE	Livestock Integration for Food and Family Enhancement
LHB	Let's Help Bohol
LPAI	Low Pathogenic Avian Influenza
MAO	Municipal Agriculture Office
MICA	Ministry of Information, Communication and the Arts
MOH	Ministry of Health
MRSA	Methicillin-Resistant <i>Staphylococcus aureus</i>
NEA	National Environment Agency
NGO	Non-government organisation
NRD	National Resilience Division
NIH	National Institute of Health
OFFLU	OIE-FAO Network of Expertise on Animal Influenza
OH	One Health
OIE	World Organization for Animal Health

OPV	Office of the Provincial Veterinarian
OWOH	One World, One Health
PAP	People's Action Party
PhP	Philippine Peso
PO	People's Organisation
POG	Passing-on-gift
PRISMA	Preferred Reporting Items for Systematic Review and Meta-Analysis
PRRS	Porcine Reproductive and Respiratory Syndrome
RO	Research objectives
RQ	Research questions
SADC	Southern African Development Community
SARS	Severe Acute Respiratory Syndrome
SOA	School-on-the-Air
STD	Sexually Transmitted Disease
SCbC	Synergistic Context-based Communication
TB	Tuberculosis
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNSIC	United Nations System Influenza Coordinator
US	United States
VLW	Village level workers
VPH	Veterinary public health
VRE	Vancomycin-Resistant Enterococci
VLW	Village level workers
VVW	Village veterinary workers
WCS	World Conservation Society

WHO

World Health Organization

Chapter 1: Introduction

Background and context

As a Development Communication (Devcom) practitioner who has been involved in animal and public health programs in the Philippines and most countries in Southeast Asia for more than fifteen years, I have witnessed the importance of communication in complementing technical and policy components to achieve program goals. In my view, communication is not only a strategic top-to-bottom management tool (limited, for instance, to a communication or public awareness campaign), but is also a process to engage and encourage participation from stakeholders that will lead to further mutual understanding, such as in addressing concerns or in resolving issues that concern health risks and biosecurity. Mayhew (2015) defined biosecurity as the protection of animals and people from infectious disease and pests through, for example, managing the movement of agricultural pests and diseases, and reducing the effects of invasive species on indigenous flora and fauna. Biosecurity also involves preventing the purposeful and negligent spreading of biological agents into human populations.

My initial interest in studying communication in relation to animal health risks, particularly how risks are understood and communicated from a socio-cultural perspective, was reflected in the graduate thesis I completed for my Master of Arts (MA) degree in Communication (Communication Research) in April 2006. It was entitled, "Communicating Risks: A study on the knowledge on Foot and Mouth Disease (FMD) risks and communication management in the maintenance of FMD-free areas in the Visayas and Mindanao". An opportunity to pursue a postgraduate research degree in Australia came after I worked full-time in my home country, the Philippines, as a Communication Specialist, in an AusAID-Food and Agriculture Organization of the United Nations (UNFAO) supported, national program

on FMD eradication. I was keen to do research that would extend the study of animal health and communication to a larger regional context in Southeast Asia.

One of my motivations to pursue this PhD research on communication and culture is the need to recognise Southeast Asian socio-cultural contexts (being a Southeast Asian native myself) in understanding health risks and biosecurity to address zoonotic emerging infectious diseases (EID).

Recognising these contexts in turn would contribute to developing alternative approaches to enhance communication. Zoonotic diseases are those that originate from animals that are transmissible to humans ("Zoonoses", 2018).

When I started my PhD candidature in 2006, there was a growing global concern about animal health issues, particularly regarding zoonotic EID. According to the World Health Organization (WHO, 2018a), between 2002 and 2003, Severe Acute Respiratory Syndrome (SARS) spread globally, and in Southeast Asia, Singapore was one of the countries with a high number of reported human cases (238 cases). Almost at the same time, human cases of the Highly Pathogenic Avian Influenza (HPAI) H5N1 virus strain were reported in Southeast Asia in countries such as Cambodia, Indonesia, Lao People's Democratic Republic (PDR), Myanmar, Thailand, and Vietnam (WHO, 2018b).

From when I started this research in 2006, it was evident that there was growing awareness of the need for more effective communication in addressing these zoonotic diseases. For instance, the role of communication in the management of an avian influenza outbreak and in disease preparedness programs was recognised as significant and necessary in educating communities (Alders and Bagnol, 2007; Alders, Bagnol, Brum, Lubis, and Young, 2009), as well as changing behaviour in disease mitigation (Chitnis and Monsoor, 2007).

As I went through my research I began to realize that there was a need for an integrated communication framework that will help address the challenges surrounding the understanding and motivation of stakeholders to take action in dealing with health risks and biosecurity. There are various communication approaches that can be applied in tackling health risks and biosecurity, such as risk communication, behavioural change communication, and strategic communication. As these approaches are appropriate, I attempted in this research to present an integrated communication framework, which may serve as a guide in adopting effective communication.

I began my research exploring socio-cultural perspectives in the contextual understanding of health risks and biosecurity in local communities and how institutional factors can influence communication in addressing zoonotic disease emergencies. As I conducted my data gathering and began analysing my initial field data, I recognised that the approaches employed in addressing zoonotic diseases for prevention, mitigation and emergency response were also the main principles of One Health (OH) and Ecohealth (EH) concepts, specifically the use of inter- and transdisciplinary perspectives. While not explicitly articulated then, the approaches adopted, the involvement of various sectors, and collaboration among different disciplinary teams in addressing zoonotic EID were the foundational principles of OH and EH approaches. Supporting this claim, I explore further the communication aspects in inter- and transdisciplinary approaches. The concepts of OH and EH are discussed further in the next chapter.

Research questions and objectives

The main objective of my research is to propose an integrated communication approach to address zoonotic diseases, which recognises the importance of socio-cultural and institutional characteristics, and

acknowledges inter- and transdisciplinary approaches. Given the general objective of my research, I specifically wanted to:

- Determine socio-cultural and institutional dimensions that shape appropriate communication of zoonotic disease health risks, and biosecurity.
- Analyse the communication approaches adopted to address zoonotic infectious diseases, especially in a disease emergency situation; and,
- Identify the existing strategies, necessary systems, and the communication gaps in responding to zoonotic emerging infectious diseases in inter- and transdisciplinary approaches.

For me to achieve my research objectives, I used qualitative methods to explore and answer four key research questions reported in this thesis. These research questions are:

- What are the socio-cultural and institutional characteristics that contribute to contextual understanding of health risks and biosecurity in Philippine communities?
- What institutional arrangements influence the choice of communication approaches to address zoonotic emerging infectious diseases in disease emergencies, as in the case study of SARS in Singapore?
- What are the emerging issues in communicating health risks and biosecurity in the context of zoonotic diseases?
- What are the emerging gaps for appropriately communicating inter- and transdisciplinary approaches such as OH and EH in the context of addressing zoonotic diseases?

Structure of the thesis

My thesis has eight chapters, including this introductory chapter. In Chapters 2 and 3, I discuss the rationale of my research work, theoretical underpinnings, and relevant literature to support my claims in my research. In Chapter 2, I provide background on the emergence of zoonotic infectious diseases in Southeast Asia. I discuss how globalisation, inadequate biosecurity and emerging threats have changed the global health landscape. I also articulate the socio-cultural implications of zoonotic EID in Southeast Asia and the relevance of multi-, inter-, and transdisciplinary approaches. I further introduce the concept of OH and EH approaches and the use of social science inquiry in addressing zoonotic diseases. I end the chapter by stating the important roles of communication in addressing underlying issues about EIDs.

In Chapter 3, I begin with a brief discussion on the epistemology of risk, and approaches to risk in the social sciences to underpin the following articulation of my theoretical leanings, relevant communication concepts, and communication studies on health risks and biosecurity. The social construction of reality (Berger & Luckmann, 1966), and risk and culture (Douglas & Wildavsky, 1982) are the theoretical paradigms that influenced me in the socio-cultural view of looking at health risks and biosecurity that helped me establish my research framework. I also explain my adherence to Development Communication and Asia-centric communication paradigms as my communication standpoint that is central to this research.

In Chapter 4, I describe the qualitative research design employed in this study. To answer my research questions, I use three methodologies: focused and visual ethnography, descriptive case study, and systematic literature review. I also discuss in this chapter the research instruments, data gathering procedure, and the forms of data analysis.

In the succeeding three chapters (Chapters 5, 6 and 7), I detail the findings in each of the three research settings that I investigated. In Chapter 5, I discuss the socio-cultural and local institutional contexts integral to understanding health risks and biosecurity, which I discovered from my ethnography study in two local communities in the Philippines. I also identify the local contexts and values in the communities deemed significant for developing the appropriate communication approach to address zoonotic diseases.

In Chapter 6, I report the findings in the case study of Singapore's experiences in disease mitigation during the SARS outbreak in 2003. From my key informant interviews that I cross-reference with selected literature, the institutional and communication arrangements that existed in addressing SARS before, and at the time of the outbreak are articulated. Lessons learned in the SARS outbreak experience, preparedness for a pandemic influenza, and relevant measures to manage future EIDs are discussed.

In Chapter 7, I describe the current communication landscape and synthesise the emergent communication discourse in inter- and transdisciplinary approaches such as in OH and EH. The main aim of this chapter is to complement my field research findings in Chapters 5 and 6, and support the integrated communication framework that I propose in my thesis.

In the final chapter, I present the discussion of findings and conclusion of my thesis. In this chapter, I introduce the integrated communication approach that I propose, which I called a Synergistic Context-based Communication Framework. I argued that synergy is an alternative to consensus-building towards mutual understanding, especially when faced with complex problems that needs to be addressed such as zoonotic diseases. I also outline in Chapter 8 the key findings in relation to each of the research questions, and the implications of the findings and the integrated communication approach.

Scope of the thesis

I position my thesis as interdisciplinary communication research that is biased with experiential learnings from Southeast Asian settings. In this research undertaking, my mentors were of various disciplines from the veterinary and biomedical sciences, and the social sciences (political science, communication and public relations, and medical anthropology) who honed me into a mature development communication scholar. I use the American Psychological Association (APA) 6th Edition as my referencing style, as this is commonly used in my communication discipline.

In doing this research I acknowledge that the study of communication to address zoonoses may be based from varying world views, motives, and end-result in mind. For example, communication may be an information and education tool to prevent zoonotic diseases. It may also be through participatory communication that zoonotic disease risks may be determined based from local practices or observations. And from these variations of situations, different communication approaches in dealing with zoonoses may surface. Specifically for my research, I did not attempt to describe the communication approaches as a result of the analysis in the field settings that I observed or cases that I analysed. Instead I focused on understanding contexts in socio-cultural settings that may be crucial in communicating biosecurity risks, and explored on communication strategies in times of disease emergency.

Chapter 2: Zoonotic Emerging Infectious Diseases, and the Need for Multiple Disciplinary Perspectives to Address Health Risks and Biosecurity

Introduction

The aim of Chapter 2 is to provide a background on the rationale of my research work, which is premised on the emergence of zoonotic infectious diseases and their relation to health risks and biosecurity. In this chapter, I will highlight the importance of different disciplinary perspectives and approaches in addressing zoonotic health risks and biosecurity. I will also consider the concepts of One Health (OH) and Ecohealth (EH). Moreover, I identify the significance of communication and its crucial role in understanding health risks and biosecurity especially in using OH and EH approaches to address zoonoses.

This chapter is in two major parts. In the first, I begin with a discussion of emerging infectious disease in relation to globalisation and risk theories as well as their effect on world health. I then discuss the emergence of zoonotic infectious diseases in relation to globalisation. I further describe the evolution of zoonotic viruses (such as influenza viruses, Nipah virus encephalitis, and SARS coronavirus) that emerged or affected countries in Southeast Asia, which is the geographical interest of my research. I also review in this section the implications of selected zoonotic disease emergencies in the region and relate these to the need to investigate and understand the importance of biosecurity.

In the second part, I consider the relevance of different disciplinary approaches in addressing zoonotic emerging infectious diseases. In this section, the concepts OH and EH—how the concepts came about, and the context of zoonoses in these concepts—will be discussed. I also stress the importance of recognising the social and cultural norms in understanding health risks and biosecurity in addressing zoonotic EID. I argue that

communication plays an important role in addressing the issues of implementing EID health programmes in prevention, mitigation, and response to zoonotic infectious diseases.

Part 1: The emergence of zoonotic infectious diseases

Globalisation, 'world risk society', and the concept of risk in the global health milieu. Globalisation is a phenomenon not just viewed in economic terms. It covers political, cultural, and technological factors and is highly influenced by historical developments in the systems of communication (Giddens, 2000). Globalisation also brought about increased cross-border flows, interconnectivity, and integration (Kobrin, 2008). Further, globalisation is described as:

... the latest stage in a long accumulation of technological advances which has given human beings the ability to conduct their affairs across the world without reference to nationality, government authority, time of day or physical environment. These activities may be commercial, financial, religious, cultural, social, or political; nothing is barred. (Langhorne, 2001, p.2)

Cheng's (2004) view is that globalisation enhances knowledge-exchange and sharing of skills and allows mutual support and benefits for the development of individuals, communities, and countries. Values are created and efficiency enhanced through global sharing and mutual support for local needs and growth. The promotion of international understanding and collaboration as well as harmony and acceptance of cultural diversity; facilitates multi-way communications, interactions and multi-cultural contributions are established.

In the public health sector, Fidler (1996) articulated three ways globalisation has influenced public health:

- a. It allowed diseases to spread rapidly and globally as the world became “small” because of technology and economic interdependence, the increase in international travel and the global nature of food production and market;
- b. Economic competition in the global market escalated with increased pressure on governments to cut expenditure, including cuts to funding for public health programs that consequently diminished capacity for emerging disease preparedness; and,
- c. Disease control has been globalised through international public health programs. This has resulted in medical advances and improved health, resulting in people living longer. As people live longer, however, overpopulation issues arise, e.g., overcrowding, lack of proper sanitation, and limitations in public health infrastructures.

In the animal health sector, globalisation has led to a substantial increase in the supply and demand for poultry, livestock, and their by-products to meet the expanding food security requirements of the world’s population. The livestock and poultry sector began to use more intensive farming practices and systems increased in size, especially in developing countries (Delgado, Rosegrant, Steinfeld, Ehui & Courbois, 1999). Poultry production increased both at subsistence level among poultry raisers in local farming communities and among commercial integrators for export (de Haan & Steinfeld, 2008; Capua, Alexander, Rideout, & Vincent, 2008). Accordingly, the global movement of animals increased. For instance, Marano, Arguin, and Pappaioanout (2007) reported that in the United States more than 37 million individual animals – various birds, live amphibians, mammals, and reptiles – were legally imported into the country between 2000 and 2004. Such animals were used in zoo exhibitions, scientific research, conservation programs, and for food, tourism and as companion animals. As animal movement and trade

continues to expand, this in turn poses risks to animal health and creates biosecurity concerns.

Integrated with globalisation is the concept of risk. Risk is inherent in the way we live as an individual and as part of a community. In his seminal book *World Risk Society*, Beck (1999) describes a society that operates in response to risk. He said:

Risk is the modern approach to foresee and control the future consequences of human action, the various unintended consequences of radicalized modernization. It is an (institutionalized) attempt, a cognitive map, to colonize the future. Every society has, of course, experienced danger. But the risk regime is a function of a new order: it is not national, but global. It is rather intimately connected with an administrative and technical decision-making process. (pp. 3-4)

Beck (2006) explained the practical reality of a world risk society and further pointed out that:

The more emphatically the existence of world risk society is denied, the more easily it can become a reality. The ignorance of the globalisation of risk increases the globalisation of risk. Or take the example of avian influenza. Ignorance accelerates the globalisation of the danger of infection. (p.30)

As new pathogens emerge, people recognise the uncertainties about novel diseases while scientific discoveries are in progress. Understanding the concept of risk, determining probable risk and acknowledging uncertainties are integral in dealing with zoonotic emerging infectious diseases.

Macgill and Siu (2005) proposed the adoption of an interdisciplinary paradigm for risk analysis, based on their observations that:

- a. Risk is perceived, defined, and assessed by people's knowledge;
- b. Risk issues are an integration of physical and social constructs;

- c. Risk issues permeate uncertainty and trust issues;
- d. Risk issues changes over time, across geographical, and cultural space; and,
- e. Effective risk management interventions are based on the quality of the knowledge (scientific and social), and on the internal congruence of that knowledge.

In summary, an interdisciplinary paradigm encompasses an assessment of the risk and a balanced use of quantitative (or positivist worldview) and qualitative (or interpretive worldview) approaches in dealing with the socio-cultural aspects and policy orientation of risks. In Chapter 3, I will discuss the theoretical underpinnings of risk, specifically the epistemology of risk and the approaches to risk in the social sciences.

Emergence of infectious diseases. Infectious disease has caused more than 40% of the global disease burden (Moore, 2006). In fact, Jones et al. (2008) reported the emergence of 335 infectious diseases between 1940 and 2004. The diseases in their database included those that are caused by newly evolved strains of pathogens; multi-drug-resistance; pathogens that have entered human populations for the first time; and pathogens that were probably present in humans historically, but have increased in incidence. Further, Jones et al. (2008) argued that the emergence and later spread of infectious diseases had significant impact on global health and the economy.

Emerging infectious diseases can be distinguished by: classification of the infectious agent; mode of transmission; most common methods of spread (such as foodborne, waterborne, vectorborne and zoonotic); or, geographic distribution (Lashley, 2007; Moore, 2006; Link, 2007). Moreover, Chavers and Vermund (2007, p.8) categorised emerging infectious diseases into:

- (a) truly new diseases that emerge in humans from zoonotic environmental sources;
- (b) newly recognised diseases that may have been prevalent or may have been uncommon, but that only

now are recognised; (c) re-emerging diseases that represent well-known infections that are now increasing in frequency, often after decades or centuries of declining rates, frequently due to failures in disease control strategies and the emergence of coinfections (like HIV) that facilitate spread; and (d) unexplained syndromes whose definitive diagnosis awaits new technical or scientific insights.

The emergence of infectious diseases has been attributed to different factors. Chavers and Vermund (2007) articulated some of the contributing factors, namely: demographic factors; social and behavioural changes; advances in health care and technology; changes in treatment and handling of water/foodstuffs; climatological and environmental changes; war and/or natural disasters; and, deliberate release of pathogens. They also provided specific examples of, and selected emerging and re-emerging diseases related to the contributing factors that they identified, as shown in Table 1.

As millions of reported human deaths were caused by diseases such as HIV/AIDS, malaria, tuberculosis and other emerging infectious diseases, Morens, Folkers, and Fauci (2004) explained that these diseases evolved because of the changing interactions between the environment and infectious agents [such as bacteria, virus, parasites, fungi, algae, and prions] as well as the behaviour of the hosts [humans and animals] that allowed infectious agents to develop new and favourable ecological niches.

Table 1

Factors Contributing to Emerging and Re-emerging Infectious Diseases
(Chavers and Vermund, 2007, p.7)

Contributing Factor	Specific Examples	Selected Related Diseases
Demographic factors	Population growth, migration, housing density, population distribution, aging	Dengue, tuberculosis, influenza, HIV, malaria, tropical parasitic diseases such as filariasis and leishmaniasis
Social and behavioral changes	Increased use of child care, liberalized sexual behavior, outdoor recreational pursuits, alcohol and drug use, transportation and distribution of goods, changes in travel frequency	HIV and other STDs, hepatitis A-B-C, pelvic inflammatory disease, measles, diphtheria, pertussis, Lyme disease
Advances in health care technology	Modern chemotherapies, styles and institutions of health care delivery, iatrogenic immunosuppression, health care-associated antibiosis and antiseptics, invasive catheter techniques	Multidrug-resistant, TB, MRSA, VRE, opportunistic infections in immunosuppressed persons
Changes in treatment and handling of water/foodstuff	Mass production of nearly all food products, water processing, use of adjunct agricultural practices such as antibiotic supplementation of feed	Cryptosporidiosis, guinea worm, schistosomiasis, diarrheal diseases, hookworm, listeriosis, hemolytic uremic syndrome, cyclosporiasis, salmonellosis, Cruetzfeldt-Jakob disease, VRE, leptospirosis

(continued)

Table 1

Factors Contributing to Emerging and Re-emerging Infectious Diseases
(Chavers and Vermund, 2007, p.7) (continued)

Contributing Factor	Specific Examples	Selected Related Diseases
Climatologic changes and environmental alterations	El Niño, global warming, natural disasters, deforestation, land use development	Tickborne diseases, highland malaria, hantavirus pulmonary syndrome, plague
Microbial evolution	Natural variation, mutation, cross-species zoonotic transmission	Influenza, HIV, leptospirosis, plague, trichinellosis, African sleeping sickness, antibiotic-resistant bacteria
War and/or natural disasters	Breakdown of public health measures	Vaccine preventable diseases, cholera, STDs, TB
Deliberate release of pathogens	Bioterrorism, bio-warfare	Anthrax, smallpox, plague, tularemia, botulism, salmonellosis, others

Zoonotic infectious diseases in Southeast Asia. Since the turn of the millennium 70-75% of emerging and re-emerging human infections were zoonotic, and most originated from wildlife (Wang and Crameri, 2014; Vorou, Papavassiliou and Tsiodras, 2007). In the succeeding sections, the evolution of zoonotic viruses, particularly influenza viruses, SARS, and Nipah, that affected some countries in Southeast Asia will be described.

Influenza viruses. There are four types of influenza viruses: Types A, B, C and D. Influenza viruses A and B can cause major outbreaks and severe disease; influenza B is less common than Influenza A and largely causes human disease. Influenza C tends to cause cold-like signs

and symptoms in children (e.g. croup) and can infect dogs and pigs (World Health Organization, 2018c, Edwards, 2014). Type D influenza viruses primarily affect cattle (World Health Organization, 2018c). Only Influenza A virus is known to cause pandemics and is found in other species such as pigs and birds. Waterfowl are its natural host (Webster, Bean, Gorman, Chambers, and Kawaoka, 1992; WHO, 2018c; Edwards, 2014).

Type A influenza viruses are described based on the type of proteins they have on their surfaces. These are haemagglutinins (H) and neuraminidases (N). There are 18 different haemagglutinin subtypes and 11 different neuraminidase subtypes (Centers for Disease Control and Prevention, 2017). The H and N antigens are constantly evolving and because of this, new strains of influenza virus continue to occur. Small changes in the H and N antigens, as a result of mutations, are termed antigenic drift. These small mutations can continue within influenza strains until the emergence of a strain that is able to infect people who are immune to preceding strains. This strain can then spread through the now very susceptible human population and can cause an epidemic. However, there will still be some similarity to older strains and some people will be immune to the new strain. Antigenic Shift results from the acquisition of totally new antigens and sometimes these new antigens are acquired from other species such as pigs and birds. It is believed that this happens when an animal or other species contracts two types of viruses at the same time and genes are interchanged – called reassortment – or when there are changes within an animal or bird influenza virus that can make it more easily transmissible to humans – called adaptive mutation. Pandemics occur when a human influenza virus acquires new antigens within a human population that is naïve to those antigens – the population has no

antibodies to the new antigens and the virus spreads causing severe infections and a high mortality rate. Only strains within the subtypes H1, H2 and H3 have been known to have been able to adapt sufficiently to be easily transmissible between humans and cause pandemics. These strains gradually adapt over time and may cause seasonal influenza outbreaks. At present only H1 and H3 viruses are widely circulating in the human population. There are other subtypes that are known to cause human disease but have not developed the ability to spread easily among humans. These include subtypes H5, H6, H7 and H9. These other subtypes have not been known to infect humans. It is unknown how long it takes for influenza viruses to adapt and cross from animal to humans and to develop transmissibility properties among humans (Edwards, 2014; Shao, 2012).

It is thought that pandemics occur as influenza viruses progress through the following stages:

- 1) When there is direct contact between humans, birds or animals, an animal or bird sourced influenza virus changes enough that it is able to cross species into humans and causes serious illness, but is not easily transmissible between humans;
- 2) In an epidemic scenario, the virus slowly adapts further and increases its efficiency in spreading between small groups of humans in limited areas; and,
- 3) Further adaptation of the virus occurs, with easy transmissibility among humans, and wider affected areas due to a short incubation period (48 hours) and international air travel (Edwards, 2014).

Type A influenza viruses constantly evolve so that new strains are likely to emerge. From the beginning of the 20th century to the present,

there have been four notable human 'flu epidemics: the 1918 Spanish 'flu; the 1957 Asian 'flu; the 1968 Hong Kong 'flu; and, the 2009 Swine 'flu. During the 1918 Spanish 'flu pandemic, an estimated 500 million persons were infected and showed clinical signs in three waves of the pandemic from 1918 to 1919 (Taubenberger and Morens, 2006). It occurred towards the end of World War I. Containment of the virus that spread mainly in military camps was a great challenge. There was limited knowledge about the virus and over time, as viral research methods improved, more information about the characteristics of this virus and the extent of the pandemic became known (see Johnson and Mueller, 2002). The influenza strain that spread at that time was identified as H1N1 and its natural reservoir was wild aquatic birds. A similar strain was known to infect pigs (Reid, Taubenberger, and Fanning, 2001; Kilbourne, 2006; Morens and Fauci, 2007).

After the Spanish 'flu, two other influenza pandemics followed — the Asian 'flu of 1957-8 and the Hong Kong 'flu of 1968-9. The public became aware of the 1957 pandemic when the *New York Times* published an article describing an epidemic in Hong Kong that affected 250,000 people in a brief period. It was later established that the subtype of the 1957 Asian flu was H2N2. The survival period of the H2N2 virus in the human population was only 11 years after which it was superseded by the H3N2 virus that was the cause of the 1968 Hong Kong 'flu epidemic (Kilbourne, 2006). The Asian and Hong Kong 'flu pandemics were milder than in 1918 with most of the deaths reported being among children and the elderly in 1957 and the elderly in 1968 (Edwards, 2014).

In 2009, a new influenza A (H1N1) virus emerged which was distinct from the H1N1 that caused the 1918 Spanish flu. Often called "2009 pandemic H1N1 influenza" or popularly known as "swine 'flu", the virus is a combination of genes from human, pig, and avian sources

that emerged in Mexico, the United States and other countries. This virus strain is a reassortment of several other strains of H1N1 (Shao, 2012; Centers for Disease Control, 2017).

Avian influenza strains may either be of high- or low-pathogenicity. The virus A(H5N1) that was first detected in 1997 and later circulated among wild and domestic avian species in countries in Southeast Asia, such as in Indonesia, Thailand, Vietnam, Myanmar, Lao PDR and Cambodia is a highly pathogenic avian influenza (HPAI) strain (Widdowson, Bresee and Jernigan, 2017). HPAI virus strains are virulent with mortality rates among infected animals as high as 100%. The infection is often self-limiting or can be quickly controlled through the slaughter and disposal of infected and at risk poultry. Low pathogenic avian influenza (LPAI) viruses, such as H7N9 influenza in the early stages of its emergence, may cause no clinical signs or only mild infections with respiratory signs, decreased egg production among poultry layers, and signs of depression (Fouchier, Osterhaus and Brown, 2003). In some cases, a virus subtype can have both low and high pathogenicity such as the H7N7 virus, where there is a low pathogenic form and a high pathogenic form (Widdowson, Bresee and Jernigan, 2017).

Due to the threats posed by influenza viruses, constant monitoring of the viruses through disease surveillance and strengthened network linkages were instituted by global health organisations to provide better influenza pandemic preparedness and coordination. For instance, the World Organization for Animal Health (OIE) and the Food and Agriculture Organization of the United Nations (FAO) jointly instituted the OFFLU (OIE-FAO Network of Expertise on Animal Influenza) network, which facilitates support and management of worldwide efforts to prevent, detect and control influenza viruses in

animals. The World Health Organization (WHO) instituted the Global Influenza Surveillance and Response System (GISRS) that monitors both human and animal influenza viruses that infect humans (Mak, Jayawardena and Poon, 2012).

Nipah virus encephalitis. Nipah virus was first reported in Malaysia. The virus was named after the place where it was first detected: Sungai Nipah New Village, Perak State (Muniandy and Aziz, 2004). From September 1998 to April 1999 the virus infected 265 people, with a fatality rate of 40% (n=105). The majority (93%) of infected humans had been exposed to pigs, later identified as the host in the transmission of the virus to humans (Lam and Chua, 2002). Millions of pigs were slaughtered to control and eradicate the disease in Malaysia. Nipah outbreaks were also reported in Singapore, particularly among abattoir workers who were handling pigs imported from infected areas in neighbouring Malaysia. There were eleven human cases and one death reported in Singapore (Yob, et al., 2001; Ahmad, 2000; WHO, 2018d). Since 2001, most human cases of Nipah virus infection have been in South Asian countries, particularly in Bangladesh and India. In Bangladesh, from the years 2001, 2003-5, 2007-15, 260 human cases were reported, with a fatality rate of 76% (n=197). In India, more than 60 human deaths were reported in years 2001, 2007, and 2018 (2001: n=45; 2007: n=5; 2018: n=12) (WHO, 2018e).

SARS coronavirus. SARS first appeared in China in November 2002. The host of the SARS coronavirus that caused havoc in 2002-3 was found to be horseshoe bats (Wang, L-F et.al., 2006; Rupprecht, Wang, and Real, 2008). During the SARS outbreak there were 8,096 cases reported worldwide, with a mortality rate of 9.6% (n=774). SARS spread to over 24 countries. In Southeast Asia, 331 cases (with a mortality rate of 13.3% (n=44)) were reported in six countries namely, Indonesia, Malaysia, Philippines, Singapore, Thailand, and

Vietnam. Singapore reported the highest number of cases (238 cases) and mortality rate (13.8% (n=33)) in Southeast Asia (WHO, 2018b).

SARS was an unknown disease when it emerged. Its aetiology and control measures were being investigated concurrent with implementation of emergency strategies to stop the spread of the virus. There were personal narratives of isolation, confusion, and panic. Stories unfolded on how the SARS epidemic affected families, communities, and a whole country (Chua, 2004). The SARS outbreak re-shaped thinking about how quickly viral infections can spread and transformed the landscape of global health and cooperation in the 21st century. It led to new efforts to improve international health systems, and the need to enact policies and draft protocols in preparation for any emerging infectious disease and response to disease emergencies.

With increased global interdependence, for instance through trade and travel, addressing infectious diseases has become more complex. It has affected health systems and the economic stability of societies. If further amplified, the complexities may cause public fear, socio-economic loss, and other negative outcomes (Morens and Fauci, 2013).

With the nature of these viruses, combined with the changing environment, it is but inevitable to anticipate the probabilities of a disease emergency or even the next pandemic. Continuous surveillance and monitoring of the viruses is necessary for disease prevention and preparation for any disease emergency. In my view, collaboration and advances in research, complemented by effective communication on surveillance and risk, is necessary.

Given the growing interaction among humans, domestic and wildlife and the significant impacts of climate change on the environment, it is now crucial to address the global challenges of EID. In response, a new integrated approach to health and risk is needed. The occurrence of new and re-

emerging zoonotic diseases has strengthened the resolve to come up with a holistic framework that would better address global health security. Also, biosecurity has become a relevant and important part of risk management and disease prevention. Biosecurity also needs to be a central part of health governance.

Conception and premises of biosecurity. According to FAO (2007), biosecurity “is a strategic and integrated approach that encompasses the policy and regulatory frameworks for analysing and managing relevant risks to human, animal and plant life and health, and associated risks to the environment” (p.3). This is just one definition of biological security or biosecurity, and the concept could have different interpretations, e.g., biosecurity is not limited to regulations and policy (Burnette, Hess, Kozlovac, and Richmond, 2013). For instance in the context of animal health and production, biosecurity relates to good hygiene and sanitation such as the practice of on-farm: movement control of animals, people and equipment; stringent cleaning and disinfection; and, isolation of sick animals (Bowman and Shulaw, 2001). Furthermore, from the Australian government’s perspective, biosecurity is crucial in preventing, responding to and recovering from pests and diseases that threatens the economy and the environment (Australian Government Department of Agriculture, 2018). Simply put, biosecurity involves actions that lessen the chance of introduction and spread of infectious agents that cause animal and plant diseases (Canadian Food Inspection Agency, 2018).

With the emergence of novel microbial threats, Collier and Lakoff (2008) identified four overlapping, but distinct domains of biosecurity, these were: “emerging infectious diseases; bioterrorism; the cutting-edge life sciences; and, food safety” (p.9). After the terrorism attacks in the United States on September 11, 2001, “biosecurity” became a popular vernacular term. It was later recognised by the US Centers for Disease Control and Prevention (CDC)

and the National Institute of Health (NIH) that having a strong biosafety program was part of biosecurity that included different aspects of ensuring “safety” and “security”. For instance, in the animal industry sector, biosecurity is regarded as the protection of animals from microbial threats and contamination (Burnette, Hess, Kozlovac, and Richmond, 2013). Biosecurity has become integral to food security and agriculture as it may also potentially impact public health, economic trade, national security and even governments (Frazier, 2010).

It is, therefore, indisputable that biosecurity and health are associated given that they operate within the same system. Applications of biosecurity involve animal health, plant health, and public safety, which the OH framework integrates and applies. Biosecurity involves multiple disciplines such as the biomedical sciences, public health, animal health, plant health, law and politics, among others. The OH concept relates to biosecurity within a global context. Also considered are the connections between public, animal, and environmental health, agriculture, microbiology and clinical practice. The application of biosecurity in the framework of OH is an advantage because of the common language used for discussions of best practices and prevention strategies (Burnette, Reed, and Delarosa, 2013).

Understanding biosecurity and recognising its importance is facilitated at a macro level within international and country-level national health discourse. However, there needs to be a similar regard for, and appreciation at a small-scale or community level so that simple biosecurity measures become a household or community practice. Pollack (2010) argued that with prevailing global health scenarios a sole institution could not address all the needs or cover all bases thus the need for a network of networks.

Part 2: Disciplinary approaches in addressing zoonotic emerging infectious diseases

Multi-, inter-, and trans-disciplinary approaches. Social, political and cultural factors are significant in empirical studies that are concerned with emerging infectious zoonotic diseases, particularly when attempting to understand the associated health risks and biosecurity. Various disciplinary approaches have been adopted in research, services, education, and policy for health and such approaches can be multidisciplinary, interdisciplinary or transdisciplinary (Choi and Pak, 2006).

Petrie (1976), in his classic publication “Do you see what I see? The Epistemology of Interdisciplinary Inquiry”, differentiated multidisciplinary and interdisciplinary efforts. The former is when different disciplines work together with little or no necessity to be aware of what the other discipline is doing, while the latter takes into account each disciplinary contribution before putting forth an integrated contribution to the proceeding inquiry. A multidisciplinary approach necessitates experts from different disciplines collectively address a complex problem as each expert views it from his or her own discipline-perspective. In contrast, an interdisciplinary approach is integration of two or more disciplines to create a new field or science, e.g., biostatistics or medical anthropology. A transdisciplinary approach has no association with any discipline and engages non-academic players in providing practical solutions for societal problems (Schelling and Zinsstag, 2015). Soskolne (2000, in Choi and Pak, 2006) articulated transdisciplinary approaches to human health as an integration of the natural, social, and health sciences in a humanities context that transcends traditional [or discipline-specific] boundaries.

I have observed that multidisciplinary, interdisciplinary, and transdisciplinary efforts in OH and EH engage scholars and practitioners from different disciplines, such as the veterinary and biomedical health sciences as well as social sciences, to examine the issues relating to EID, particularly pertaining to zoonotic health risks and biosecurity. This is also related to adopting appropriate communication approaches (FAO, 2011). It is crucial to ensure that timely and relevant information is relayed and prompt actions are taken to address zoonotic infectious disease prevention and control, especially in emergency disease scenarios. There has been more interest in recent times in the inter-relationships among human, animal and ecological health and the need for a holistic approach to addressing emerging infectious zoonotic diseases (Nguyen-Viet, et al, 2015). In my view, important issues such as understanding and the practical use of knowledge in local communities often lags.

One Health (OH) and Ecohealth (EH) approaches to Zoonoses. After the SARS outbreak in 2003 and the HPAI outbreaks in 2004, the OH paradigm in addressing zoonotic diseases gained in popularity (Davis, 2011; Zinsstag, Schelling, Waltner-Toews, and Tanner, 2011; Zinsstag, et al., 2012). A practical definition of OH is “any added value in terms of health of humans and animals, financial savings or environmental services achievable by the cooperation of human and veterinary medicine when compared to the two medicines working separately” (Zinsstag, Waltner-Teows, and Tanner, 2015, p. 41). Gibbs (2014) summarised a number of other definitions of OH as outlined in Table 2.

Table 2

Definition of One Health (Gibbs, 2014, p. 87)

Source	Definition
One Health Commission	“One Health is the collaborative effort of multiple health science professions, together with their related disciplines and institutions – working locally, nationally, and globally – to attain optimal health for people, domestic animals, wildlife, plants, and our environment”.
Food and Agriculture Organization of the United Nations (FAO)	“A collaborative, international, cross-sectoral, multidisciplinary mechanism to address threats and reduce risks of detrimental infectious diseases at the animal-human-ecosystem interface”.
World Organisation for Animal Health (OIE)	“While not specifically defining One Health, (OIE) endorses the approach as a collaborative and all-encompassing way to address, when relevant, animal and public health globally. This collaboration should not be limited to only the international level, but must be translated as a new and fundamental paradigm at national levels”.
One Health Global Network	“One Health is to improve health and wellbeing through the prevention of risks and the mitigation of effects of crises that originate at the interface between humans, animals and their various environments”.
One Health Committee of the World Small Animal Veterinary Association	“One Health or One Medicine proposes the unification of the medical and veterinary profession with the establishment of collaborative ventures in clinical care, surveillance and control of cross-species disease, education, and research into disease pathogenesis, diagnosis, therapy and vaccination. The concept encompasses the human population, domestic animals and wildlife and the impact that environmental changes (‘environmental health’) such as global warming will have on these populations”.
One Health Initiative	“A worldwide strategy for expanding interdisciplinary collaborations and communications in all aspects of health care for humans, animals and the environment”.

The definitions coined by the different organisations tend to be dependent on the operational context to which the framework applies. But commonalities intrinsic to all definitions are: multiple disciplinary approaches; and, collaboration at all levels—local, national and global—that are of particular concern to animal and human health, and the environment. Historically, an understanding that human and animal health were linked was evident even in the times of the Greek Philosopher, Aristotle. Integrative specialisations such as comparative medicine and veterinary public health have evolved from the pre-modern to the modern 20th century (Bresalier, Cassidy and Woods, 2015).

In the late nineteenth century, the German pathologist and public health advocate, Rudolf Virchow contributed to the concept of integrated health. He was thought to have been the first person to use the term “zoonosis” and to conceptualise “one medicine”, although no direct written evidence proves this. Virchow worked with a Canadian physician, Sir William Osler, to establish the field of veterinary pathology as an academic discipline in veterinary medicine in a North American school. Osler was the first to use the term “one medicine” in English language literature. Schwabe in 1984 recognised the similar paradigm of human and animal health and coined the term “One Medicine”. Examples of one medicine are the successful collaborations of medical and veterinary sciences over a hundred years that contributed to the improvement of animal and human health (Conrad, Mazet, Clifford, Scott & Wilkes, 2009; Zinsstag, Waltner-Teows, and Tanner, 2015).

The OH paradigm in the 21st century was further articulated into the concept of “One World, One Health” (OWOH), which was first used by the Wildlife Conservation Society (WCS) at their annual symposium in 2004. Global health experts and representatives from various international organisations such as WHO, FAO and US Centers for Disease Control had gathered to discuss the current and potential movements of diseases among

human, domestic animal and wildlife populations. Drawing from case studies on avian influenza, Ebola and chronic wasting diseases, the panel of experts concluded that international and interdisciplinary approaches in addressing threats to the health of life on earth must be prioritised. The significant output of the symposium was a 12-point list of recommendations that became known as the “Manhattan Principles”. The basis for establishing a holistic approach to prevent disease epidemics and epizootic outbreaks while maintaining a stable ecosystem beneficial to humans, their domesticated animals and biodiversity that supports all life populations was outline in the document. Following the OWOH initiative, international organisations, namely WHO, FAO and OIE, all adopted the “Manhattan Principles” in their continuous global efforts to mitigate the spread of zoonotic emerging infectious diseases (Cumming, D.H.M. and Cumming, G.S., 2015; One World, One Health, n.d.).

In 2008, WHO, FAO and OIE, together with the United Nations Children’s Fund (UNICEF), World Bank and United Nations System Influenza Coordinator (UNSIC), produced a consultation document entitled, *Contributing to One World, One Health: a strategic Framework for Reducing Risks of Infectious Diseases at the Animal-Human-Ecosystems Interface*. The objective of the Framework was to establish the best means to reduce risk and curtail the global impact of epidemics and pandemics due to emerging infectious diseases. This objective was to be achieved through enhancing disease intelligence, surveillance and emergency response systems (at national, regional and international levels); strong and stable public and animal health services; and, effective national communication strategies (FAO, OIE, WHO, UNSIC, UNICEF & World Bank, 2008). The need to improve biosecurity measures to control the emergence and spread of infectious diseases was emphasised in the strategic document. Prevention of bioterrorism (or agro-terrorism) was deemed a global good. Surveillance, therefore, must cover all potential emerging infections, both natural and deliberate. Moreover, inherent

in the OWOH strategic framework is building on existing approaches and mandates of the international institutions and partners to create flexible network-structures (informal and formal networks) that will allow a rapid response at all times to any new health emergencies. The OWOH framework complemented the established mechanisms already set by international organisations, such as FAO, OIE and WHO, to improve communication, coordination, and collaboration (International Office of Epizootics, 2009).

To further the OWOH paradigm, a meeting of experts was organised in March 2009, by the Public Health Agency of Canada which was entitled “One World One Health: from ideas to action”. International experts and representatives from governments, Non-government organisation (NGOs), academe and the private sector participated in the three-day meeting. Key recommendations emanating from the meeting were: to “foster political will; support partnership and collaboration; encourage data sharing and integration; build capacity (infrastructure and skills); develop communication strategies/plans; provide incentives for reporting adverse events; encourage stakeholder and community engagement; and, develop supra-country approaches” (Public Health Agency of Canada, 2009, p.3).

What makes OH different in terms of the organisation, strategy and practice from its other related disciplines, such as veterinary public health, EH, and resilience, is the equal focus OH gives to the health of people and animals (Zinsstag, Waltner-Toews, & Tanner, 2015). The OH framework has become evident in policy and mitigation approaches to emerging zoonotic disease emergencies as applied by practitioners and governments in developing and limited-resourced countries. Aside from responses to mitigate HPAI (FAO, 2009), the OH paradigm has been applied to research and development projects such as: the Health for Animals and Livelihood Improvement (HALI) Project in Tanzania. Within this project, the links between zoonotic EID and water sanitation and its impact on the health and

livelihoods of rural people and the local ecosystem (Mazet, et al., 2009) were examined. An open 'tool box' for practical use in disease surveillance that integrates animal-human epidemiological studies and health services improvement was developed (Zinsstag, et al., 2009). Similarly, a OH framework has been adopted by governments and professional associations such as the European Commission, Federation of Veterinarians of Europe and US Florida state's Department of Health - Bureau of Environmental Public Health Medicine, among others (Zinsstag et al., 2009; Veterinarians without Borders Canada, 2010).

Ecohealth or Ecosystem Approaches to Health is a related field to One Health. Nguyen-Viet, et al. (2015) defined Ecohealth as a "comprehensive approach to understanding health at the human, animal and environmental interface in a socio-ecological systems context" (p.1). It is an action-oriented approach with goals to improve understanding about a situation and as an intervention to benefit human health and well-being (Bunch and Waltner-Toews, 2015). This term was developed by networks of researchers including the Communities of Practice for Ecosystem Approaches to Health (CoPEHs) and the International Association for Ecology and Health which was mainly supported by Canada's International Development Research Centre (IDRC). Ecohealth adopts different systemic and participatory approaches to understand and promote health and well-being whilst also taking into account complex social-ecological interactions (Veterinarians without Borders Canada, 2010). In contrast to OH which is institution-based, EH originated from biological ecology and land conversion initiatives. A 'bottom-up' approach is used that encourages collaboration among specialists from different fields such as veterinarians, medical doctors, epidemiologists, ecologists, social scientists, philosophers, and includes indigenous perspectives (Unger, 2015). The IDRC Ecohealth Program Initiative, has three methodological pillars, namely: transdisciplinarity, participation, and equity

(Lebel, 1994 as cited in Unger, 2015). These pillars were expanded into the six key principles of EH, namely: systems thinking; knowledge to action; transdisciplinary; participation; equity; and, sustainability (Charron, 2012 as cited in Unger, 2015).

One Health has also been associated with other related fields, veterinary public health (VPH) and resilience. Unlike OH, VPH's central interest is public health (Zinsstag, Waltner-Toews and Tanner, 2015). Another related field is resilience. Carpenter et al. (2001 in D.H.M. Cumming and Cumming, 2015) articulated that resilience is the capacity of a system to learn and adapt. They also defined it as the extent of change that a system can undergo while being in the same domain and retaining the same controls on structure and function; and, degree that a system can self-organise. If OH gives significant focus to both human and animal health, VPH and resilience give more prominence to ecological resilience and sustainability (Zinsstag, Waltner-Toews and Tanner, 2015).

One Health and Ecohealth do not work in silos or solely depend on one discipline. Holistic approaches need to come from various perspectives, and for any OH and EH initiative to be successful are conducted in a collaborative setting.

Social and cultural implications of zoonotic emerging infectious diseases in Southeast Asia. Enhancing socio-cultural inquiry in understanding risks and appropriately communicating disease prevention strategies in communities is important. Webster and Walker (2003) argued that scientists' knowledge is still limited as to precisely how and when a viral strain will develop into a pathogenic form that would cause an influenza pandemic. They further explain:

We understand the virus' structure, how it enters the cells of the human body and how it evades detection by the host's immune system, but knowing these things is not enough to stop another

pandemic. The issues extend beyond science into the realms of international and local politics, national budgets, and deeply entrenched cultural traditions. (p.122)

In agreement with Webster and Walker, it is indeed beneficial that other discipline-perspectives and approaches are considered in preparing for a public health threat. Key outcomes of my research, specifically in a Southeast Asian setting, explore the socio-cultural and institutional characteristics as well as practices that influence understanding of health risks and biosecurity. Some of the ways animals are raised, slaughtered and prepared for food consumption are socio-culturally intrinsic. Certain animal raising practices and human health beliefs are ingrained from local and indigenous contexts of countries in this region that need to be recognised (Llarena, Edwards, Surma, Fitch & Benigno, 2012). For instance in Vietnam, duck blood [or other avian species] is a famous, traditional delicacy in the country, and locals would drink it raw or use it as ingredient in some dishes (Do, 2017; Tao and Tieu, 2017). With the spread of avian influenza, this traditional practice can pose a health risk. In 2005, at the beginning of avian influenza outbreaks in Southeast Asia, news reports disclosed that a Vietnamese woman tested positive with H5N1 poultry virus after drinking raw duck blood (Reuters Health E-line, 2005; Reuters News, 2005). This prompted the Vietnam government to ban the selling of this delicacy in the country (Sipress, 2005; Mason, 2005). Another cultural practice in some countries in Southeast Asia is cockfighting. In Thailand, cockfighting is a risk factor in the spread of avian influenza (Delabouglish et al., 2015). At the height of the HPAI outbreaks in Thailand, Paul et al. (2015) discovered in their social anthropology study that cockfighting chicken owners were collectively reluctant to take part in disease surveillance activities. The suggested reason for such reluctance is the existing gaps between the logic and understanding of surveillance as well as associated activities with cockfighting. It was further recommended that

multi- and transdisciplinary research in the social sciences would explore the interactions among the stakeholders and the communities' collective actions in facing the risks.

Because of the unique social and cultural characteristics of each country in Asia, aspects of social and human behaviour are major contributors to the emergence of zoonotic EID. Another significant aspect is the governance and institutional systems in countries in the region as they each function differently. The enactment of policies or lack of political will to support health and biosecurity risk management, and disease emergency preparedness are crucial and are highly influenced by institutional mechanisms in each country. How each country is governed and the function of its institutional systems, in turn, affects the global health scenario.

Adams, Novotny, and Leslie (2008) examined international health discourse from an anthropological perspective and they observed that: 1) participation of non-governmental organisations in international health programs have expanded; 2) science and pharmaceutical research are globalised; and, 3) biosecurity concepts have used militarised languages in public health programs. With these observations, they supported the field of 'Global Health Diplomacy', which underpins an approach to better understand the causes of human suffering and be able to identify ways to lessen the suffering. This suggestion is premised on social justice and critical medical anthropology in coming up with interventions or solutions in cross-border health programs.

In terms of disease control and emergency preparedness, international NGOs, donor agencies and other humanitarian organisations support poorly resourced countries, such as those in Southeast Asia. Technical and funding support, necessary to build local capacity in disease mitigation and preparedness plans, was provided. Resources were poured into the preparation of emergency plans and protocol to minimise the risks of a

possible global influenza pandemic, especially with the onset of HPAI (Scoones and Forster, 2008). Ear (2009) analysed the political economy of foreign aid and avian influenza in Cambodia. The study found that the motivations of the aid donors were openly centred on prevention and detection of a potential pandemic because the potential pandemic is also a threat to the donor countries. Further the study concluded that poor governance, and common institutional failure were observed in the country's response to avian influenza. It was recommended in the study that governance and disease response initiatives should effectively go together.

In my view, with the changing health landscape, it is important to not just be prepared for a pandemic, but to have a broader understanding of the probabilities and nature of the emergence of infectious diseases and their social impacts. As we now live in a 'world risk' society (Beck, 1999), we need to be looking at health issues from different disciplinary contexts, integrating varying transdisciplinary frameworks to holistically address global health concerns.

The roles of communication and underlying issues in emerging infectious disease health programmes. Communication is certainly eclectic and could not be captured in a simple definition. Frank Dance (1970), in his paper: "The 'Concept' of Communication", outlined distinctions or "critical conceptual differentiation" of the various definitions of communication, namely, level of observation or abstractness, intentionality and normative judgement. He further proposed a "family of concepts, rather than a single theory or idea, which collectively defines communication" (p. 4, as cited in Littlejohn and Foss, 2008). In this classic publication, Dance (1967) examined early essays on human communication theories and commented that:

- (1) whatever else human communication may turn out to be, it is most certainly complex, and (2) human communication is an area of multidisciplinary concentration rather than an area existing in

isolation from life, social sciences, arts, humanities, or other areas of study in their pure form. Even though individual scholars choose to dedicate themselves exclusively to the study of communication *ipse*, they must be aware that assistance in their study can come from almost any source. In fact, information concerning human communication, like human communication itself, may be found anywhere within individuals, societies or the study of either. (3) Communication in general and human communication in particular is a process (ibid, p.293).

Communication is significant in the advocacy of health issues and the promotion of public agendas in health programmes. It makes use of different approaches and multi-media platforms as well as other technological innovations and indigenous means to disseminate information, and increase awareness of specific aspects of a programme. On the other hand, communication may also be viewed as a process of development, and an approach to social change in disease prevention and control (Llarena, Edwards, Surma, Fitch and Benigno, 2012).

The accomplishments of different programmes using communication for health promotion, the establishment of linkages or networks, advocacy and the empowerment of stakeholders dominate the health communication literature. Best practices and lessons learned in the implementation of various communication activities in development programs are featured in special interest websites, such as: *The Communication Initiative* (<http://www.comminit.com/>) and *Knowledge for Health* (<https://www.k4health.org>).

Communication campaigns (i.e. development and production of Information, Education and Communication (IEC) materials and social marketing are frequently harnessed as part of the implementation of health programs. Communication research based on, for example, information

needs assessment, knowledge, attitudes and practices (KAP) studies, and media preferences are useful for decision-making, and developing communication activities to increase awareness of intended stakeholders, many public health programmes tend to focus on producing information materials to educate or inform the public. Communication is recognised as being very important, especially in relation to behavioural change, given that cultural and socio-economic issues in disease mitigation are important, such as in the avian influenza/pandemic influenza preparedness programme (Chitnis and Monsoor, 2007). FAO (2013) identified four key lessons learned from their experiences in communication of HPAI. These were: 1) awareness alone does not change behaviour or practices; 2) participatory approaches work better; 3) establish cross-sectoral collaboration at an early stage; and, 4) building government capacity is a key.

Communicating health risks and biosecurity may necessitate an integrated approach for more effective mitigation and prevention of zoonotic EID. The rapid communication of appropriate messages, the commitment and continuous involvement of all stakeholders, the keen promotion of the long-term benefits of adhering to health standards and appropriate practices, in my view are some of the key elements to be integrated into biosecurity and health agendas.

Furthermore, there are several challenges to effectively communicate behaviour change among different stakeholders. There is a need for improved risk communication to intensify stakeholders' commitment to, and participation in biosecurity and health management initiatives. These challenges include: gaps in knowledge about health risks and existing practices of stakeholders; under-appreciation of technical expertise of communication specialists; implementation of creative ways to integrate practical knowledge and practices for more appropriate communication approaches to biosecurity and health; poor judgement and lack of stronger

resolve, among those involved, in the communication aspect of disease emergencies, jeopardising the transparency of actual scenarios, especially in a disease crisis situation (Llarena, Edwards, Surma, Fitch & Benigno, 2012).

Conclusion

From the literature that I have reviewed in this chapter, I have shown that the advantages of globalisation have been the creation of positive opportunities through open access to world markets, information and communication technologies, political participation and exposure to other cultures. Globalisation has paved the way for the emergence of novel zoonotic diseases and the re-emergence of old infectious diseases. We now live in a 'risk society' where the probabilities of further catastrophic disease spread are anticipated. It is most important that we know as much as possible about these diseases, understand and predict how these diseases can be mitigated and develop disease emergency preparedness plans. In doing so, there needs to be a collaborative and holistic approach in conceptualising, planning and implementing strategies to address any zoonotic disease emergency. In dealing with zoonoses, it is critical to acknowledge health risks and biosecurity measures as part of disease mitigation. In this study, I explore potential biosecurity risks within local and culturally driven settings. In Chapter 5, I report on an ethnographic study that I conducted in selected communities in the Philippines, which I view are potential scenarios for health risks and biosecurity concerns.

The OH and EH frameworks are transdisciplinary and engage multi-stakeholder collaboration in ensuring a secure global health landscape. As these two frameworks are increasingly adopted in an integrated approach, it is important to explore how communication is part of these approaches.

The Southeast Asian region is a critical area as most of the more recent devastating zoonotic diseases, either originated, or caused havoc in countries

in this area. Individual Southeast Asian countries have unique socio-economic, cultural and institutional characteristics. Health concerns need to be addressed with these factors at the fore. It should also be recognised that local communities in the region have certain practices, and indigenous knowledge that needs to be considered if we want improved communication about health risks and biosecurity practices.

Communication is integral and its potential goes beyond the production of information materials. An integrated approach to communication is also necessary to make progress in dealing with zoonoses within OH and EH frameworks. Conveying effective messages without delay, commitment and continuous involvement of all stakeholders, keen promotion of the long-term benefits of adhering to health standards and appropriate practices, are some of the key elements that need to be integrated into the biosecurity and health agenda.

In the next chapter, I will further discuss the theoretical underpinnings and the communication standpoint that guided me in my study.

Chapter 3: Theoretical Underpinnings and Communication Standpoint¹

Introduction

In the previous chapter, I set the background for my research on the global and Southeast Asian regional context of zoonotic emerging infectious disease (EID), and its relation to biosecurity. I introduced the inter- and transdisciplinary concepts of One Health (OH) and Ecohealth (EH), which are significant approaches in dealing with zoonotic diseases. I also highlighted the relevance of multiple disciplinary perspectives, such as in recognising the social and cultural norms in understanding health risks and biosecurity. I argued that communication that is founded in investigation of socio-cultural characteristics plays an important role in addressing zoonotic diseases.

In this chapter, I expand my discussion on socio-cultural theoretical frameworks, relevant communication concepts, and communication studies relating to health risks and biosecurity. The aim of this chapter is to present the theoretical underpinnings and communication perspectives that guided me in shaping this research and influenced me in my analysis. I structured this chapter in three sections. In the first section, I discuss the epistemology of risk, such as the approaches to risk in the social sciences, and how I view the concept of risk. In the second section, I explain the theories, “Social Construction of Reality” (Berger & Luckmann, 1966), and “Risk and Culture” (Douglas & Wildavsky, 1983), which influenced me in the socio-cultural view of looking at health risks and biosecurity. In the third section, I reflect on the tenets of Development Communication (Devcom) and Asiacentric communication paradigms as central to my research in examining communication in relation to biosecurity and zoonotic diseases.

¹ Part of this chapter was published in the *The Philippine Journal of Development Communication*, Vol. 7 January – December 2015.

Epistemology of Risk

The epistemology of risk is complex and there are various approaches to consider when examining it. One view is from a highly scientific-technical tradition and a quantitative definition (Kaplan & Garrick, 1981; Kaplan, 1997). Technical risk analysis and psychometric approaches that quantitatively measure cognitive perceptions of risk (Slovic, 1987, 2016) are some examples of the application of this tradition.

In sociological theory, Arnoldi (2009) suggests three dominant frameworks in articulating the notion of risk. These are:

1. The works of Ulrich Beck (*World Risk Society*, 1999) and Anthony Giddens (*Runaway world: How globalisation is reshaping our lives*, 2002), where they regard risk as new dangers from modern technologies. Within this framework, consideration is given to how scientists, politicians, the public and mass media handle the complexities of risk and uncertainty that in most cases can cause lack of public trust in the authorities and be a poor basis for decision-making.
2. The work of Mary Douglas (*Risk and Blame*, 2002) and her colleague, Wildavsky (*Risk and Culture*, 1983), that centres on the cultural understanding of what people fear and the risks that they are willing to take.
3. The governmentality framework of risk by scholars influenced by Michael Foucault (on his notion of governmentality). In this framework the government uses risk to direct and hold power over people using various technologies.

In another view of examining risks, Lupton (1999a) categorised risk theories into three approaches: cognitive science, socio-cultural and social constructionists. She also classified the theoretical literature according to its epistemological position, associated perspectives and theories, and key

questions on risk, as shown in Table 3. I position my research within the weak constructionist category of the continuum of Lupton's epistemological approaches to risk. Human understanding and meanings are influenced by what is known or understood as concepts (of reality), which are ingrained in sociological thought as well as by culture (Arnoldi, 2009; Littlejohn, 1999). As I studied local communities in this thesis (Chapter 5), I find that local-context and indigenous notions are valuable considerations in analysing potential risks.

Focusing on investigating culture in risk, Jasanoff (1993) argues that exchanges between the quantitative and qualitative 'cultures' of risk analysis would be beneficial for future studies of risk. She points out that aside from the advantages in regulatory functions, the interactions of quantitative and qualitative frameworks would also be useful in defining and implementing research programs:

Insights drawn from social, political and ethical studies of risks can be used to improve the methods of conducting risk assessments and communicating about risks... qualitative research can help illuminate the blind spots in established approaches to risk assessment. (p.128)

Therefore, a balance of the quantitative and the non-quantitative sides of the sciences is essential in empirical studies of risks. Not only is more knowledge gained about risk, but such an integrative approach also contributes to the communication of risk.

Table 3

The continuum of epistemological approaches to risk in the social sciences
(Lupton, 1999a, p. 35)

Epistemological position	Associated perspectives and theories	Key questions
<i>Realist:</i> Risk is an objective hazard, threat or danger that exists and can be measured independently of social and cultural processes, but may be distorted or biased through social and cultural frameworks of interpretation.	Technico-scientific perspectives; most cognitive science theories.	What risks exist? How should we manage them? How do people respond cognitively to risks?
<i>Weak constructionist:</i> Risk is an objective hazard, threat or danger that is inevitably mediated through social and cultural processes and can never be known in isolation from these processes.	‘Risk society’ perspectives; critical structuralism ² ; some psychological approaches. ‘Cultural symbolic’ perspectives; functional structuralism ³ ; psychoanalysis, phenomenology.	What is the relationship of risk to the structures and processes of late modernity? How is risk understood in different socio-cultural contexts? Why are some dangers selected as risks and others not? How does risk operate as a symbolic boundary measure? What are the psychodynamics of our risk responses? What is the situated context of risk?

(continued)

² Critical structuralism uses the approach in “critiquing the ways in which social institutions — such as the government, economic and legal system — wield power over individuals, reducing their capacity for agency and autonomy” (Lupton, 1999a, p. 26).

³ Functional structuralism sees “how social and cultural structures and systems serve to maintain social order and the status quo and deal with ‘deviance’ or divergence from accepted norms and social rules concerning behaviour” (Lupton, 1999a, p. 26).

Table 3

The continuum of epistemological approaches to risk in the social sciences (Lupton, 1999a, p. 35) (continued)

Epistemological position	Associated perspectives and theories	Key questions
<i>Strong constructionist:</i> Nothing is a risk in itself — what we understand to be a 'risk' (or hazard, threat or danger) is a product of historically, socially and politically contingent 'ways of seeing'.	'Governmentality' perspectives; post-structuralism.	How do the discourses and practices around risk operate in the construction of subjectivity and social life?

In my view for a specific 'risk' to be acknowledged as a potential danger, the technical assessment of risk, like those based on probability-modelling, may not be sufficient in itself in coming up with strategies in communicating risk. I argue that there has to be consideration of the socio-cultural understanding of the probable existence of risk. Human experiential knowledge, language, and a set of symbols that articulate and demonstrate the probable existence of a particular risk may complement the technical assessment of risk.

Theoretical Paradigms on Exploring the Social and Cultural Notion of Risk

Beliefs and reactions to certain risks vary between each individual, cultural group or community, thus risk may be socially and culturally constructed (Fewer, 1999, as cited in Llarena, 2006). *The Social Construction of Reality* (Berger & Luckmann, 1966), and *Risk and Culture* (Douglas &

Wildavsky, 1983) are classical theories in which social processes and culture are considered as important parts in making sense of everyday life.

The Social Construction of Reality. As risks are ascertained by what we know and not necessarily by what we have experienced, Within the Social Construction of Reality (Berger & Luckmann, 1966), it is articulated that everyday reality is socially constructed by human interaction (Blog Sociology, 2014). Berger and Luckmann (1966) premised this theory on the sociology of knowledge where the relationship of human thought and the social context within which it occurs is examined. Berger and Luckmann (1966) further explained that questions of reality and knowledge are initially justified by social relativity, thus what is 'real' for one person may be not be 'real' for another. 'Reality' is a quality that relates to the phenomenon that we recognise is independent of our own volition, while 'knowledge' is the certainty that the phenomenon is real and possesses specific characteristics.

In relating The Social Construction of Reality to my research, I argue that social relativity is considered in understanding the notion of a potential risk. What is perceived to be a potential risk in a developed country or area may not be perceived as risk in a Southeast Asian context, or in a personal situation. What an individual views as risk may not be viewed as such by another person. It is important that in communicating health risks and biosecurity, that there is a deep understanding of the 'reality' and the 'knowledge' that the cultural group or local community has of the potential risk, to ensure the appropriate communication approaches are used.

Moreover, social construction as a communication theory suggests that the social world is constructed and understood through words, actions and media products (Leeds-Hurwitz, as cited in Littlejohn and Foss, 2008). Hence, signs and language are also integral to understanding. Signs may include symbols, texts and gestures or actions that have socially interpreted meanings.

Risk and Culture. Douglas and Wildavsky (1983) claim that disagreement remains about: what is perceived to be risky; how it has been perceived to be risky; and, what to do with the risk. They argue that risk is different for each person as they worry about different things, and in dealing with risk, people's knowledge and their actions are out of alignment. Douglas and Wildavsky (1983) also view the perception of risk as a social process, hence different social principles guide the behaviour and influence the judgement of what dangers must be most feared, what risks are worth taking, and who should be allowed to take them. Further, Douglas and Wildavsky (1983) posit that when a cultural approach or perspective is used in risk perception, it allows us to see how community consensus relates some natural dangers to moral defects. It assumes that a society creates its own view of the natural environment as well as influences the choice of dangers worth attention. Therefore, risk perception studies anchored from a cultural model explore the different characteristics of social life that causes varying responses to danger.

Risk Communication. Risk communication is not the last of a linear process but a vital part of the risk analysis process, it goes hand-in-hand with the science of risk assessment and the procedures of risk management (McCrea, 2005). My view is that risk communication should be towards a holistic approach, which in the context of my research should support efforts in addressing health and biosecurity risks. Lundgren and McMakin (2018) differentiated risk communication from technical communication. Technical communication focuses on scientific and technical information with the purpose of informing, educating, or persuading. Comparing this with risk communication, the purpose of risk communication is motivating intended audience or stakeholders to take action to prevent or manage known risk factors. Risk communication is a dialogical process to generate feedback for

decision-making, unlike technical communication that adheres to a unilinear process of disseminating information.

In the next section, I will focus on discussing the communication lenses used in this research, and related studies relevant to communication of health risks and biosecurity.

Communication standpoint: Asiacentric and development communication

Development communication and its applications in addressing animal health risks and biosecurity. As society has transitioned, from feudalism to industrialisation and to globalisation, the modes and processes of communication have transformed with each era. Modernity and the push for socio-economic development are inevitable, especially in the Global South, where most of the least-resourced countries, including countries in Southeast Asia, are located. The Devcom paradigm emerged in accordance with these communication changes.

Communication models and approaches for development evolved from being unilinear to transactional, and into systems model. Communication is viewed as one-way in unilinear models, wherein, the sequence of events has a beginning and an end. Classical communication models proposed by Lasswell (1948) and Berlo (1960) illustrate a unilinear approach. The transactional models are two-way and cyclical where equal roles are shared among those involved in the communication process. Osgood's Model of Communication (in Schramm & Roberts, 1971) and Kincaid's (1979) Convergence Model of Communication are examples of transactional models. The systems model comprises interacting, interdependent and interrelated elements that work as one system towards a communication aim or set of goals (Velasco, Cadiz & Lumanta, n.d.).

Development communication emerged as an interdisciplinary field from social psychology, sociology, economics and political theory. It has been referred to “as a tool to bring about development in less developed countries” (Goonasekera, 1995, p.1). However, this simplified definition overlooks the important attributes of development communication in theory and practice. Waisbord (2001) describes Devcom as theories of development and social change that apply to communication strategies and principles in the developing world. He added that Devcom traces its origin to Latin America, Africa and Asia during the boom of post-war international aid programs. Such programs were intended to raise the economic status of the people as well as transform political and social infrastructure to “catch up” with the modernisation of the West.

Alternatively, Quebral (1971 in Quebral, 2006; 2002, 2012), a pioneer scholar in development communication in Asia, has provided several versions of Devcom definitions over the years. Quebral’s articulation of development communication is presented in Table 4. In her initial definitions in 1971 and 2002, Quebral considered Devcom as an ‘art and science of human communication’, but in her current definition she asserts that the discipline looks into the ‘science of human communication’. It could also be seen from the definitions that social change has evolved from ‘speedy transformation’ to ‘society’s planned transformation’, to ‘transitioning of communities’. Further, the view of ‘poverty’ has evolved from the initial definition of ‘mass poverty’ to ‘state of poverty’, to the current view: ‘all forms of poverty’. The context of development has been redefined as well, from ‘economic growth’ to ‘socio-economic growth’, then later as ‘overall growth’.

Table 4

Nora C. Quebral's (2002, 2006 and 2012) definition of development communication

Year defined	Definition of development communication
1971	"the art and science of human communication applied to the speedy transformation of a country and the mass of its people from poverty to the dynamic state of economic growth that makes possible greater social equality and the large fulfilment of the human potential"
2002	"the art and science of human communication linked to a society's planned transformation from a state of poverty to one of dynamic socio-economic growth that makes for greater equity and the larger unfolding of individual potential"
2012	"the science of human communication linked to the transitioning of communities from poverty in all its forms to a dynamic, overall growth that fosters equity and the unfolding of individual potential"

Note: texts in boldface are mine to emphasise the words to highlight the changes of key concepts in the definition of Devcom over the years.

Quebral (2012) explained that the changes in the definition were brought about by reflection on how each or both social processes of development and communication take a new meaning from insightful research and practice. Quebral (2006) further expounded on the attributes of Devcom:

- a) The aim of Devcom is to both disseminate information and be a motivational catalyst among the different levels of stakeholders (i.e. national, sectoral or project levels). As motivation is a key element in Devcom, it is not enough to

only provide information, but more so to motivate the people to act on the information. This makes the communication successful.

- b) Devcom practice explicitly begins with learning objectives, and then applies appropriate methods or approaches to achieve the objectives.
- c) Devcom is used for public awareness and not as a publicity stance for merely media-exposure or image building.
- d) Devcom uses various communication tools or channels appropriate to meeting the set objectives. It is not limited to mass communication media, but indigenous media like theatre or role play are also explored.
- e) Devcom is audience-oriented thus its approaches are biased to the intended stakeholders' perspective so as to better reach them and overcome the communication gap.
- f) Devcom seeks to persuade and influence, similar to the principles of advertising or public relations. However, Devcom provides its intended audience various options that would allow them to come up with their own informed-decisions.

According to McPhail (2009) Devcom discourse is categorised into two streams. One stream came about after the World War II. It was from a Western nations' perspective of development, which is centred on economic goals and indicators where a top-down or linear communication approach is recommended. Daniel Lerner (1958), Wilbur Schramm (1964) and Everett Rogers (1962, 2003) supported this type of discourse. The second stream surfaced in the late 1960s and originated in Latin America. This stream, in contrast with the first, veered away from the singular economic framework of development and adheres to a bottom-up approach. The Devcom

discourse later embraced culture, language, women, environmental issues, small steps or projects, the role of technology and grass roots participation (Goonasekera, 1995).

Manyozo (2006) mapped out the foundations and origins of Devcom from 1940 to 1980 as seen in Table 5. Some scholars argue that there are challenges in defining development communication, especially in the early literature. There is difficulty in placing it in a particular theoretical tradition because of its interdisciplinarity. Aside from its theoretical function, it is also action-oriented in nature (Roman, 2005; Tehranian, 1994), which is similar to Quebral's conception of Devcom discussed earlier. In terms of communication for development in Asia, Torres and Manyozo (2018) articulated the following as dominant themes in practice: participatory planning; rural communication; learning and knowledge exchange as capacity building; professional degrees in Devcom; mainstreaming development communication in civil service; information, communication technologies (ICT) for development; and, an evaluation framework for capacity development.

It is inherent that development communication is a process that uses tools such as media towards social change. One of the principles of development communication is the sharing of knowledge to reach a consensus for action, which considers the needs, interests and capacities of those involved in the social change process (Servaes, 2008). Part of development communication are the roles that media play and various views of which communication is situated in achieving social change. Melkote (2018) articulated the evolutionary perspectives of development communication as:

- a) modernization model of development where mass media is central in the development paradigm (Lerner, 1958);

Table 5

The emergence of development communication (Manyozo, 2006, pp. 80-83)

Timeline	'School'	Contribution/s to Devcom	Theorists/ organisations
1940	The Latin America School	Television and radio entertainment-education (Radio <i>Sutatenza</i> for rural education; Miners' Radio Network in Colombia) - pioneered in community-based radio for rural development education	Luis Ramiro Beltran, Juan Diaz Bordenave, Miguel Sabido, Paulo Freire, Jose Barrientos
1950	The Bretton Woods School	Western-led efforts of "linear communications in Third World development experiments" in which "production and planting of development in indigenous and uncivilized societies" were promoted	Everett Rogers, Daniel Lerner, Wilbur Schramm, Jan Servaes, Srinivas Melkote, H. Leslie Steeves, UNESCO, World Bank, FAO, Johns Hopkins Centre for Communication Programs, SADC Centre of Communication for Development, IDRC
1950s	The Los Baños School	Development broadcasting; agricultural development communication – "pioneered the design and implementation of communication tools in the promotion of sustainable development that were based on coherent method and theory"	Nora Quebral, Felix Librero, Alexander Flor, Ely Gomez, Juan Jamias, Madeline Suva, Virginia Samonte, Communication Foundation for Asia, Philippine Press Institute, International Rice Research Institute

(continued)

Table 5

The emergence of development communication (Manyozo, 2006, pp. 80-83) (continued)

Timeline	'School'	Contribution/s to Devcom	Theorists/ organisations
1960	The African School	Rural radio; theatre for development – “taking theatre to the people” as well as use of radio in community education, adult literacy, health and agricultural education.	Penina Mlama, Christopher Kamlongera, Zakes Mda, Robert MacLaren, Ngugi wa Thiong’o, Mapopa Mtonga, Derek Mulenga, David Kerr, Jean-Pierre Ilboudo, Center for Rural Broadcasting Studies of Ouagadougou (CIERRO)
1970	The Indian School	Radio/television for rural development; development journalism	Mehra Masani, George Verghese Keval Kumar, Joseph Velacherry, University of Poona, Delhi University, University of Kerala
1980	Post-Freire School: Participatory Development Communication	Communication for social change/development-visual anthropology, community theatre, public journalism, radio for development, development radio broadcasting – “comprises institutional collaboration between First World and Third World Devcom organizations”	UPLB College of Development Communication ⁴ , IDRC, FAO Communication Project, UNESCO, Rockefeller Foundation, Ford Foundation, World Bank

⁴ It is relevant to note that I earned my Bachelor of Science degree in Development Communication from this university.

- b) diffusion of innovations (Rogers, 2003) supporting the linear and top-bottom view of communication in the adoption of new technologies;
- c) social marketing strategies for behavioural change (Kotler and Roberto, 1989) that supports the transmission model and top-bottom view of communication in attempting to affect change in the attitude and practices of intended stakeholders;
- d) entertainment education approach or edutainment as termed in other literatures, which embeds educational content in the use of media (like radio, TV, community theatre) in communication programs;
- e) ethnocentric development discourse in which cultural biases in development paradigms are alternative to Western-centric views of modernization;
- f) participatory model of development where social change emerges from the participatory process that include indigenous social and cultural aspects of development besides economic considerations;
- g) participatory rural appraisal applied in development communication, which integrates various tools and techniques in working with people who lack formal education or literacy skills.
- h) participatory action research (PAR) is based on the critical and liberation-based approaches of Freire (1970) that is an alternative to the positivist or objective view of development communication in social change; "PAR is committed to social transformation for justice" (p.80);
- i) empowered participation in development is different from the other participatory approaches as it is focused on the empowerment of people such as building local capacities and equity; and,

- j) social justice in development primarily aims to redefine how development communication would play an integral role to address and reverse inequality as well as injustice in social change.

Following the critical stance in development, it is argued that social and cultural aspects are crucial in development communication for social change (Melkote, 2018; Servaes, 2008; Waisboard, 2001). Particularly in health communication theories in cultural settings Dutta (2007) proposed two approaches, the culture-centred and cultural sensitivity approaches. The culture-centred approach is premised from theories and practices that emerged within the culture, while the concept of cultural sensitivity approach furthers the agenda of status quo and its aim is to use messages cognizant of the cultural understanding of the intended audience. Dutta's (2018) culture-centred approach is not only limited to health communication but expands to social change communication where communication for social change theory and practice should emerge 'from' and 'with' the marginalised.

In the Philippines' Foot and Mouth Disease (FMD) control programme, principles of Devcom were employed in one of its component strategies—the public awareness and communication component. Alcos, Caro, Llarena and Benigno (2002) discussed communication management that complemented the other technical strategies used in FMD control, e.g., vaccination, quarantine and disease surveillance, in its national disease eradication campaign. Also implemented in the FMD national campaign as specialised communication support projects were the community theatre (Llarena and Benigno, 2002) and the School-on-the-Air (SOA) program (Rojo-Laurilla, 2002). These programmes were used to increase public awareness and farmers' support in eliminating FMD, especially in the infected areas. The community theatre was an alternative medium used in communicating

FMD control and prevention messages, particularly in the northern part (Cordillera Administrative Region) of the Philippines, to reach local livestock raisers and villagers. The mobile theatre presentations used the local language, and were open to the public. It had a popular following in the local areas and was used by other public health development programs as it was a cost-efficient approach in comparison to broadcast and print media (Llarena and Benigno, 2002). However, in other parts of the Philippines, radio remained the most preferred medium and source of information. The SOA program was first used by agricultural schools and offices in the 1960s as an agricultural extension tool. The goal of SOA is to educate farmers about development topics and concerns such as farming systems and management, and pest management. It has become an innovative learning approach as it uses both mass media and interpersonal communication (Rojo-Laurilla, 2002).

Communication plays a significant role in community awareness and education about zoonotic disease. Effective communication and education were important elements of a disease control strategy in the case of the H5N1 Highly Pathogenic Avian Influenza (HPAI) (Alders & Bagnol, 2007; Alders et al., 2009). It was recognised that the various stakeholders should have a common understanding of the problem for effective communication. Based on case experiences in working in less-resourced countries, Alders and Bagnol (2007) recommended that in preparing and delivering messages, the following should be considered:

- involving key stakeholders;
- developing credible messages within the context of the social, cultural and economic realities of the intended audiences;
- conducting message pre-testing;
- disseminating clear and scientifically-sound technical procedures suited for different situations;

- developing balanced and informative messages that do not cause panic;
- developing good communication and messages on post culling compensation; and,
- acknowledging that different circumstances will require different methods in message dissemination.

Furthermore in addressing the Avian Influenza outbreaks in Asia, studies on the knowledge, attitude, and practices (KAP) were extensively conducted (Xiang, et. al, 2010; Mav, et. al, 2012; Manabe, et. al, 2012). The studies were relevant for behaviour change communication. Behaviour change communication (or social and behaviour change communication) uses communication approaches to promote changes in knowledge, attitudes, norms, beliefs, and behaviours. It also pertains to strategic use of messages and activities through various channels to reach a wide array of segments in society (Johns Hopkins University, 2016). Piotrow, et. al (1997) proposed the US' Population Communication Services' Steps to Behaviour Change (SBC) framework, which was comprised of five stages of change: knowledge, approval, intention, practice, and advocacy. Further it was articulated:

“The SBC framework shows how individuals and groups progress from knowledge to sustained behavior change and advocacy. It emphasizes that behavior change—and thus communication intended to influence behavior—is a process. It recognizes that behavior change is the goal but that people usually move through several intermediate steps before they change their behavior. Furthermore, it suggests that people at different stages constitute distinct audiences. Thus they usually need different messages and sometimes different

approaches, whether interpersonal communication, community mobilization, or mass media". (p.23)

Aside from Behaviour Change Communication, the pragmatic use of Devcom emphasises the importance of participation and stakeholders' engagement. Caro et.al (2012) articulated the need for participatory approaches in research and implementation of animal health communication. In the application of Devcom principles when dealing with health risks and biosecurity, tapping the influence of community leaders is a beneficial approach. Habermann (1978) recognised that village level workers (VLW) in the agriculture sector had communication roles. It was through the VLW that feedback and insights were obtained from the recipients of information or knowledge at a grassroots level. Habermann (1978) enumerated the functions of the VLW:

- (1) information function—VLW provide a two-way information flow and as mediators between the villagers and outside organisations;
- (2) motivation function—the VLW's social and personal influence in the villages will help motivate and persuade the villagers;
- (3) function of legitimization of the new practice—as the VLW are aware of the social values they would know what the local conditions are and may set an example among the villagers in adopting a new technology or system introduced;
- (4) provide the instrumental conditions—the VLW can facilitate financial or technical support from the central agency or collaborating organisation if necessary for the adoption or as a back-up to the new practice. (pp. 59-60)

Aside from these functions, Habermann (1978) noted that the VLW were also perceived as:

- (1) the marginal communicator, being the mediator between two different kinds of social systems—the development agency (i.e.

NGOs, government institutions) and members of the traditional village;

(2) the gate-keeper, as the VLW opens the gate for communication between their village and the outside world then they can help reduce the communication flow to and from the centre if they think it is reasonable;

(3) the key people that possess the ability to influence (personal and social influence) their community;

(4) an opinion leader who has the central position within the communication structure of their villages and to whom many people in the community go to for advice;

(5) the formal leader who merits social acknowledgement and prestige in the community;

(6) a group leader wherein the groups are tapped to gain more influence or support from the people in the community. (pp. 60-70)

Habermann illustrated the roles of VLW as social agents for development. They were a potential human resource that could mobilise communities to take action.

In health and biosecurity management, village veterinary workers (animal health) and village health workers (public health) help in information dissemination and community disease surveillance. For instance, in Lao PDR and Cambodia, village veterinary workers (VW) are part of the organisational structure of the government's livestock department and veterinary services. They help with the country's disease control, surveillance and public awareness activities (Claridge, 1996; ECTAD, 2009; Ballard, 2005; Mondry, et al., 2005). They are the front line in local disease emergency response. Some are community volunteers while others are recruited by the district/provincial government office. They gain a basic knowledge in disease recognition, and skills in treating disease symptoms as

well as in administering first-aid treatment from their training. The village worker/volunteers' potential is advantageous in supplementing government services in less-resourced countries. Similarly, in one of the provinces in the Philippines, there are village volunteers known locally as barangay livestock aides (BALA), who assist in village disease surveillance. I investigated the BALA in Bohol Province as a case study about local institutional arrangement in communities. I discuss the findings in chapter 5.

As articulated earlier in this chapter, culture is part and parcel of Devcom. Community participation is especially evident in countries in Southeast Asia. For this reason, gathering disease information through community participation is an alternative to a formal assessment of health and biosecurity risks. In Myanmar, Naing Oo & Robertson (2013) conducted an epidemiological study on FMD using the *Dutaik* approach to gather information about diseases and public awareness of animal health programmes. Naing Oo & Robertson (2013) further explain:

Dutaik is a Myanmar word which means sitting together with knees touching on the same level and is usually conducted on a low "daybed" rather than on chairs. It is usually used to discuss specific issues or topics with set objectives. There is no rank or class differentiation between participants or between visitors and hosts. It is based on mutual understanding and collaboration and consequently usually results in a good output. The use of *Dutaik* talk is a traditional way of undertaking meetings in villages in Myanmar to discuss or "brainstorm" topics. It is also used to discuss new ideas or approaches with local people who appreciate talking with knowledgeable people in an open and transparent manner. It can be used as a tool to intervene and fill the gap between the modern sciences and traditional beliefs. (p. 63)

Similar to the *Dutaik* local approach in Myanmar, there may be local institutional capacities or arrangements that can be maximised as a potential approach to promoting good practices on addressing health risks and biosecurity, which is the aim of this thesis.

Another part of the cultural aspect that is important to observe and take into consideration in development communication research are the roles and dimensions of gender. Particularly in animal disease control and biosecurity, adopting a 'gender lens' is crucial in optimizing opportunities and resources for livestock production systems, value chains and even in addressing infectious diseases. Also, being aware of the gender dimensions may contribute to identifying biosecurity risk along the livestock and poultry livestock chains (World Bank, FAO and IFAD, 2008). For instance, Curry, Huss-Ashmore, Perry, and Mukhebi (1996) argued that by determining who does what would help in knowing who is in the best position to observe clinical signs that may pose as animal health concerns. Further, studies done on livestock production systems management in developing countries indicated that women were major managers, has resource accessibility and established networks in sharing information especially in raising small ruminants (Valdivia, 2001; de Haan, 2001).

Asiacentric communication for understanding the implications of animal health and biosecurity risks. Complementing the earlier section on development communication is the emerging field of Asiaticentric communication. There is great potential for future theoretical and empirical research in this emerging area of communication scholarship. Chu (1988) made three suggestions for potential research: (1) "impact of communication from the west on an Asian audience; (2) the study of communication between Westerners and Asians, that is, the problem of intercultural communication; and (3) development communication" (pp. 206-207).

The study of communication from an Asian perspective has progressed over the years. However, it is argued that the communication discipline is still dominated by U.S.-centric and Eurocentric scholarship. Communication needs to be reassessed within the bounds of Asian societies (Miike, 2006; Menon, 1988). Lawrence Kindcaid's (1987) *Communication Theory: Eastern and Western Perspectives* and Wimal Dissanayake's (1988) *Communication Theory: The Asian Perspective* addressed the need to expand communication scholarship to include an Asian point of view. These books paved the way for the development of communication theories based on an analysis of religion, language, culture, local norms and ways of understanding across the Asian region. In addition, Kim's (2002) book, *Non-Western Perspectives on Human Communication: Implications for Theory and Practice*, provided a comprehensive review of studies that contrasted western and non-western approaches to exploring communication concepts and constructs, argued that there is a western bias in the communication discipline. One suggestion is comparing European and American models of independence with East Asian models of interdependence (Hanaki, 2003; Winn, 2005; Valente, 2005).

Asiacentric communication scholarship is "a theoretical system or a school of thought in communication whose concepts, postulates and resources are rooted in, or derived from the cumulative wisdom of diverse Asian cultural traditions" (Miike, 2002, p.2). Miike further explained that cultural and communication theories from Asian perspectives are grounded from these important points of Asiacentric communication scholarship: it is not simply theoretical or empirical knowledge about Asian cultural systems of communication; it embraces a diverse, rather than monolithic concept of Asia; and, it complements, rather than rejects, America-centric and Eurocentric communication scholarship.

According to Miike (2007) the Eurocentric field of communication theory claims five biases. These are: (1) individuality and independence; (2) ego-centredness and self-enhancement; (3) reason and rationality; (4) rights and freedom; and (5) pragmatism and materialism. He argued that in Eurocentric communication education public speaking is required, and not public listening. For example, in Western societies, successful communication that is mostly favoured is being able to speak clearly and persuasively with reason and logic. Juxtaposing the biases of Eurocentric communication with the Asiatic perspective illustrates how the communicative behaviour of the latter values the individual's emotion and acts of silence. In Asia, an emphasis on emotion is an inherent trait in communication. For instance the concept of *ninjo* in Japanese culture, is core to their human relationships, hence, significant in understanding the behaviour and communication of Japanese (Seki, 1971). Seki (1971) pointed out that there was no English equivalent to *ninjo*, but it may be translated as: human affection; the heart or feelings common to man; kindness. He cited that *ninjo* is not plain human desire or human feeling. He further explained that if a Japanese refers to an individual as 'a person of *ninjo*' it could mean that the person is true to his peers, warm-hearted, cordial in nature and furthermore, does not forget on or gives limitlessly without expecting anything in return. *Ninjo* in Japanese culture is not only directed to human beings, but also toward nature and inanimate beings.

It is strongly assumed that humans do not only make rational decisions, but are also sensitive to emotional sensibilities (Tu, 2001 as cited in Miike 2007; Kincaid, 1987). For this reason:

Communication from an Asiatic perspective is a process in which we feel the joy and suffering of all sentient beings. Emotional, not conceptual, convergence plays a pivotal role in Asian communication, and this convergence is often possible when the

listener, who is ego-decentred and other-directed, attempts to sense and read the emotional dynamics of human interaction. To be communicatively active in the Asian sense thus is to be perceptive, receptive and introspective to 'feel together' with fellow humans, nature and the spirits. (Miike, 2007, p. 275)

Asian communication studies are characterised by the *Yin* and *Yang*. In a Chinese context, yin and yang is the concept that the world's phenomenal existence is conditioned by two polar contrasts of light and dark, the positive and negative (Wilhelm, 1979, as cited in Chen, 2006). Likewise, observations of the different behaviours of Western and Asian societies show that the former tends to be individualistic while the latter is toward collectivism. Chen (2006) postulated that in Asian culture and communication studies, the contrast of Western and Asian perspectives draws the following opposing forces: holistic vs. atomistic, harmonious vs. confrontational, interconnected vs. reductionist, and logical vs. intuitive. Furthermore, indigenous concepts in Asian cultures—such as the Thai concepts of *bhunkun* (reciprocation of favours) and *kreng jai* (consideration, familiarity and comfort) and communication concepts rooted from *Sikolohiyang Pilipino* (Filipino Psychology) such as *pakikitungo* (transaction/civility with), *pakikisalamuha* (interaction with), *pakikilahok* (joining/participating with), *pakikibagay* (in conformity with/in accord with), *pakikisama* (being along with), *pakikipagpalagayan/pakikipagpalagayang-loob* (being in rapport/understanding/ acceptance with), *pakikisangkot* (getting involved), *pakikiisa* (being one with)—are valuable inputs to the progress of Asiacentric communication theories (Miike, 2006). Pe- Pua and Protacio-Marcelino (2000) described *Sikolohiyang Pilipino* (Filipino Psychology) as:

.... the psychology born out of the experience, thought and orientation of the Filipinos, based on the full use of Filipino culture and language. The approach is one of 'indigenization from within' whereby the

theoretical framework and methodology emerge from the experiences of the people from the indigenous culture. (p. 49)

Another difference in the Asian and Western communication styles is characterised by high-context and low-context cultures (Hall, 1981). High-context cultures, such as Asian societies, maintain collectivistic cultures that rely heavily on looking at the overall situation to interpret the meaning of the event, thus having a message-context orientation (Hall, 1981, as cited in Griffin, 2012; Littlejohn and Foss, 2008). Low-context cultures are individualistic societies that depend more on message content (Hall, 1981, as cited in Griffin, 2012).

Stella Ting-Toomey developed the Face-Negotiation Theory (Ting-Toomey, 1988; Ting-Toomey, 1994; Gudykunst, Ting-Toomey, & Chua, 1988), in which the explanation of 'facework' in different cultures was presented. Face is contextualised as an image of oneself in relation to others and "facework is the communication behaviours people use to build and protect their own face and to protect, build, or threaten the face of another person" (Littlejohn and Foss, 2008, pp. 172-173). The Face Negotiation Theory can also be related to the Filipino concept *hiya*. *Hiya* is a "sense of propriety" (Pe-Pua and Protacio-Marcelino, 2000, p.55).

In Asian cultures, confrontation is avoided to maintain harmonious relationships. To some extent facts are not openly disclosed and avoidance of issues could be misinterpreted as adverse untruthfulness. However, this indifference is motivated culturally to maintain balance or harmony in relationships. Another part of culture is language and how it is used. In an Asian context, there are concepts and values that connote risk-taking behaviours that are expressed in indigenous language. The Filipino cultural value *bahala na* is one example. The attitude of *bahala na* welcomes the possibilities of uncertainties and the challenges that it might bring. The word *bahala* denotes *Bathala*, an ancient name for a supreme deity that is a term

used by various Philippine groups, which can be traced to the Sanskrit *bhatara* or 'lord' (Tan, 2008). Mercado (1976, cited in Tan 2008) countered this interpretation and claimed that *bahala* may have come from the Sanskrit *bhara* that means 'load'. This means that the expression *bahala na* is closer to the meaning 'be responsible for' or 'assuming the load'.

Lagmay (1977, as cited in Pe-Pua and Protacio-Marcelino, 2000) explained that *bahala na* is not equivalent to the Western concept of fatalism but, rather that of "determination and risk-taking" (p.55). Furthermore, he clarified that:

When Filipinos utter the expression "*Bahala na!*" they are not leaving their fate to God and remaining passive. Rather, they are telling themselves that they are ready to face the difficult situation before them, and will do their best to achieve their objectives. The expression is a way of pumping courage into their system so that they do not buckle down. In fact, even before they have said "*Bahala na!*" they have probably done their best to prepare for the forthcoming situation (ibid, p. 55).

Aside from the Filipino indigenous concept of *bahala na*, other Asian countries may have cultural values related to risk-taking principles that are worth exploring. Understanding such indigenous concepts may provide novel insights about how local stakeholders could better grasp the idea of uncertainty and contextualise risks to improve capacity to communicate effectively.

Language is one of the main elements in bridging communication gaps. Hickler (2007) conducted an anthropological-participatory assessment on communication about HPAI in Cambodia. He underscored the significance of indigenous terms in animal health, particularly in the nominal identification of animal diseases. In his study, Hickler emphasised the importance of working with the local taxonomy or indigenous terms,

specifically of poultry diseases *dan kor kach* (or *dan kor rech*, depending on the region in the country) and *pdash sai back sei/sei* to relate to Cambodian backyard farmers. Hickler explained:

Dan kor kach is a generic term for seasonal illness and death in chickens. It is considered natural, impossible to prevent, and difficult to treat. In technical terms *dan kor kach* refers to Newcastle disease, but could mistakenly be used to refer to HPAI, given the similarity of symptoms. *Pdash sai back sei/sei* is a new term that has been introduced by HPAI awareness campaigns. (p.2)

The use of these terms is crucial to crafting the messages for communication campaigns. In his research findings, Hickler pointed out that there was confusion about the new term, *pdash sai back sei/sei* and its relationship to *dan kor kach* which became an obstacle to behaviour change communication in the country. He further recommended management of the meaning of, and relationship between, the terms. This was articulated to provide clearer descriptions or definitions of the new indigenous terms that were being used in reference to the emerging disease.

Conclusion

Relating the two classical theories (The Social Construction of Reality, and Risk and Culture) in my research, I assert that a socio-cultural view in understanding risks, considers local practices, language, and signs or text as integral parts of a collective construction on what are perceived to be potential health risks and biosecurity concerns. As long as the majority of the community or cultural group does not claim it to be a real risk, even with knowledge of that risk, there will be no sense of urgency, and it may take time before appropriate action would be taken. In such situations, communication plays an important role in listening to, understanding the community perception, and creating awareness about the potential risk that may either

amplify or attenuate risk information. Communication is a means to educate and initiate a change in attitude or behaviour of stakeholders.

The Asiacentric Communication scholarship is significant to the study of how risk is communicated, especially from social and cultural perspectives. A situation where Asiacentric Communication could be considered is where a potential argument between emotion versus rational factors in risk perception arise. Rational underpinnings in assessing risks are openly accepted in Western societies, but in the Asian context it may not always be the case. Asians tend to grasp the concept of risk as real when dictated by their intuition and experiential knowledge. Another case may be when confrontational versus harmonious scenarios are at hand in communicating risk or in dealing with crises and conflict management. Asian societies would want to maintain harmonious relations or the status quo rather than instigate a conflict.

Devcom and the Asiacentric Communication paradigms support communication approaches that are appropriate to the characteristics of Southeast Asian societies. Participatory communication, use of various communication channels (like broadcast media, face-to-face communication, community theatre), and deep understanding of indigenous language and practices, are some of the elements that may contribute to enhance the active engagement of stakeholders at all levels in creating mutual understanding and instigate participation.

Chapter 4: Research Design

Introduction

In this thesis, I draw on social science perspectives, specifically from the communication discipline, to investigate and understand social and cultural contexts for health risks and biosecurity in addressing zoonotic diseases. I employ a qualitative research design. The aims of qualitative research are to explore meaning-making processes and understand the meaning individuals in a community or group attribute to a social or human phenomenon. Researchers who engage in this approach adopt an inductive process of inquiry and consider the complexities that come with the situation or phenomenon being studied in its natural setting (Creswell, 2013). A person's subjective experiences and meanings are significant to the research process. Qualitative research is usually used if the main aim of the study is to explore, explain, or describe a phenomenon (Leavy, 2017).

I adopted a qualitative research design as it complements my world view as a scholar. I lean towards social constructivism and the interpretive paradigm, which is consistent with my theoretical lenses and communication standpoint as discussed in the previous chapter. In social constructivism, reality is viewed through a subjective and contextual understanding of the world. There could be multiple meanings and interpretations to these subjective meanings, which are negotiated socially and historically, and where social inquiry is dependent on the research participants' views of the situation or phenomena being studied (Creswell, 2007).

In this chapter, I discuss the design of this research, which includes three distinct methodologies to investigate the following research questions:

- What are the socio-cultural and institutional characteristics that contribute to contextual understanding of health risks and biosecurity in Philippine communities?

- What institutional arrangements influence the choice of communication approaches to address zoonotic emerging infectious diseases in disease emergencies, as in the case study of SARS in Singapore?
- What are the emerging issues in communicating health risks and biosecurity in the context of zoonotic diseases?
- What are the emerging gaps for appropriately communicating inter- and transdisciplinary approaches such as OH and EH in the context of addressing zoonotic diseases?

The research was conducted in three distinct phases. This chapter is therefore structured in three sections to consider the:

- ethnographic fieldwork which was conducted in the Philippines in October and November 2008;
- a case study of the management of SARS in Singapore, drawing on different data sources, including interviews conducted with Singapore government representatives in January 2008; and
- a systematic literature review focusing on communication in the One Health and Ecohealth literature from 2004 to 2018.

The research instruments, data gathering procedures, concepts and the forms of data analysis used for each methodology are also discussed in the following section. The ethnographic research was crucial to collect field data on local institutions and community practices that illustrates health and biosecurity risk management. The case study of SARS in Singapore was deemed to be an appropriate inclusion in the thesis as it may provide 'good practices' in communication management especially in times of unknown disease crises. The systematic literature review on communication in One Health and Ecohealth was done to describe the dominant communication-related themes that are for potential research or communication strategy considerations. These three methodology approaches provided data that were

valuable inputs in developing the communication framework described in Chapter 8. In Table 4 a summary of each research phase/methodology and the specific research questions it is designed to address is provided.

I was granted approval for each phase of the field research by Murdoch University's Human Research Ethics Committee in 2007 (Ethics Permit 2007/018; Ethics Permit 2008/203).

Table 6

Matrix summary of the methodologies employed in the research

Research Questions (RQ)	Methodology				Research Objectives (RO)
RQ 1: What are the socio-cultural and institutional characteristics that contribute to contextual understanding of health risks and biosecurity in Philippine communities?	Ethnography				Determine socio-cultural and institutional dimensions that shape appropriate communication of zoonotic disease health risks, and biosecurity.
	Study sites:	Study participants:	Data collected and data gathering procedure:	Data analysis:	
	Local communities in the Provinces of Benguet and Bohol in the Philippines	Village animal health volunteers	Qualitative information from individual and group interviews, researcher's observations in field notes and visual documentation	Categorization , patterns and thematic analysis	

(continued)

Table 6

Matrix summary of the methodologies employed in the research (continued)

Research Questions (RQ)	Methodology				Research Objectives (RO)
RQ 2: What institutional arrangements influence the choice of communication approaches to address zoonotic emerging infectious diseases in disease emergencies, as in the case study of SARS in Singapore?	Case Study				Analyse the communication approaches adopted to address zoonotic infectious diseases, especially in a disease emergency situation; and, identify the existing strategies, necessary systems, and the communication gaps in responding to zoonotic emerging infectious diseases in inter- and transdisciplinary approaches.
	Study site:	Study participants:	Data collected and data gathering procedure:	Data analysis:	
	Singapore	Key officials of AVA and MICA who were involved and knowledgeable about the country's SARS outbreak experience in 2003	Qualitative information from key informant interviews; relevant text or publications on SARS outbreak in Singapore (The book "A Defining Moment: How Singapore Beat SARS")	Thematic analysis	

(continued)

Table 6

Matrix summary of the methodologies employed in the research (continued)

Research Questions (RQ)	Methodology			Research Objectives (RO)
RQ 3: What are the emerging issues in communicating health risks and biosecurity in the context of zoonotic diseases?	Ethnography and Case study			Determine socio-cultural and institutional dimensions that shape appropriate communication of zoonotic disease health risks, and biosecurity.
RQ 4 What are the emerging gaps for appropriately communicating inter- and transdisciplinary approaches such as OH and EH in the context of addressing zoonotic diseases?	Systematic literature review			Identify the existing strategies, necessary systems, and the communication gaps in responding to zoonotic emerging infectious diseases in inter- and transdisciplinary approaches
	Research inquiry specific for the systematic literature review	Data collected and data gathering procedure:	Data analysis:	
	(i) What is the trend of social science research-focused studies in One Health and Ecohealth, particularly in communication and culture, from year 2004 (post-SARS) to 2018? (ii) What are the emerging themes in the literature that captured the relevance of communication in One Health and Ecohealth?	Searched literature using keywords: communication; socio-cultural; culture; One Health; Ecohealth; and, zoonoses from selected databases and online resource	Descriptive statistics and thematic analysis	

Ethnographic study in Bohol and Benguet

I explored local settings in selected communities in the Philippines through ethnographic research. Ethnography is employed in studying societies and cultures of certain groups or communities. Observational techniques are used to answer descriptive research questions that are focused on beliefs, practices, behaviours, norms and values of the people or study participants. These are further discussed in the following subsections.

Principles of ethnography. Ethnography is contextual, holistic, and reflexive. It is presented from an insider perspective of the culture as observed by an 'outsider' (Boyle, 1994 as cited in Richards & Morse, 2007). Ethnographic research is simply common-sense knowledge being told from the inside (Brewer, 2000). Ethnography, founded from the field of anthropology in the social sciences, requires fieldwork and uses researcher's observations as the primary source of information. In communication research, the ethnographic approach is best employed in fieldwork research to describe a group, their communication patterns, and the attached contextual meanings unique to their cultural groups (Pernia, 2004). Documents (i.e. letters, memos, official records, maps, etc.) interviews, informal conversations, and visuals (i.e. photos, film or video footage) are used as secondary data sources. Hence, the role of the researcher is critical as it is reliant on the keen use of his or her senses and interpretations in recording data observations through field notes and researcher's journal or diaries (Richards & Morse, 2007; Hammersley & Atkinson, 2007; Gobo, 2008; O'Reilly, 2005; Frey, et. al. 1992).

Richards & Morse (2007) stated that ethnography can take various forms such as: traditional ethnography, focused ethnography, critical ethnography, (participatory) action research and visual ethnography. Traditional ethnography is comprehensive and requires longer fieldwork or immersion in the community because usually the researcher is unfamiliar

with the culture under study. In contrast, focused ethnography centres on evaluation or gathering information on a specific research interest or special topic that the researcher has pre-determined even before the start of the fieldwork (Richards & Morse, 2007).

Furthermore, the use of visual images, such as photographs or video footage, complement the written field data in researchers' notes and journals (Pink, 2007). Photographs and films have been used in anthropological research since the beginning of the twentieth century. The seminal work of Bateson and Mead (1942) in Bali used photographs and film which established the visual anthropology sub-genre. A growing interest in using visual media in fieldwork and the study of socio-cultural phenomena (O'Reilly, 2005; Jacknis, 1988) was initiated by this pioneering work. In visual ethnography, photographs and films can serve dual purpose in research — as a tool to collect the data and as part of the data to be analysed. In the field of archaeology, for example, photographs as artefacts are integrated with the records searched which provide more detail and greater accuracy to the time and space under study (Collier Jr., 2003).

Ethnography is observational research. Gold (1958, as cited in Angrosino, 2007) explained that the involvement of the researcher in ethnographic studies can be classified into four categories: complete observer; observer-as-participant; participant-as-observer; and, complete participant. As a complete observer, the researcher is as detached as possible from the setting under study, and neither seen or noticed. The researcher who is an observer-as-participant is known and recognized by the study participants, who know that observations were done solely for study purposes. Further, the researcher observes for short periods to set the context for interviews, and other forms of the research. A participant-as-observer takes part in the life of the group of study participants and is more engaged. He or she is seen as a 'friend' and a neutral researcher. The researcher who is a complete

participant, or in traditional anthropology is termed 'going native', fully engages and completely integrates with the people and their activities so much so, that he or she goes unnoticed within the setting.

Ethnography and the study of health risks and biosecurity. In my view, ethnography can provide in-depth understanding to 'common sense' or indigenous knowledge and local practices, which often are loosely taken for granted. Observations from ethnographic research may reveal deeper insights or an experiential understanding of the people in the local communities that prove vital in the prevention and control of emerging infectious diseases. For instance, Rimi et al. (2014) conducted focused ethnography in Bangladesh when evaluating the risks of avian influenza transmission in poultry slaughtering practices, specifically slaughtering sick poultry. They conducted observations of slaughtering practices, in-depth interviews, and focus group discussions to determine the reasons for doing those practices. One of the reasons identified in their study was the influence of customs and rituals in slaughtering practices. Furthermore, in this qualitative study, it was found that exposure to poultry slaughtering, during different procedural stages of the practice, allowed potential transmission of avian influenza virus.

Biosocial approaches, which consider the local context in terms of the social, cultural, political, and economic factors, are beneficial to disease control in relation, for example, to pandemic influenza. Local engagement is crucial in the development of an effective and ethical epidemic control program (Kleinman, Bloom, Saich, Mason, & Aulino, 2008). One case in point is Padmawati and Nichter's (2008) study in Central Java, Indonesia in which the community response to, and perceptions of avian influenza were seen as a biosocial and biopolitical challenge, rather than an epidemiological challenge. In contrast, in this thesis, I investigate the ways in which local practices and understanding are significant to preventing disease and epidemiological challenges.

Fieldwork sites, agenda, and data collection. A combination of my literature review as well as my previous experiences in the area of animal health and communication facilitated the selection of the appropriate socio-cultural contexts to be studied (Llarena, 2006). My *a priori* knowledge and research experience helped me to determine the two provincial areas in the Philippines that were selected for this ethnography study. These study sites were Benguet in Luzon and Bohol in Visayas as shown in Figure 1. These areas were selected because of their contrasting geographical and cultural settings.

Specific contextual local arrangements in which were depicted certain cultural practices, handling of animals for food consumption during a cultural practice, and a local institutional system were investigated. These were:

1. the *Cañao* ritual practice of the local people in Benguet that has an animal-human interface relevant to health risks and biosecurity; and
2. Bohol provincial government's Barangay Livestock Aide (BALA) Program that is a case of an institutional system in local communities deemed relevant for disease prevention and control.

I used focused and visual ethnography to probe and document these practices. I was a complete observer, but on a few occasions, I took an observer-as-participant role. The collection of field data included interviews, visual documentation, and government documents. I initially held consultative meetings with local counterparts in each of the provincial areas to organise the data-gathering activities, fieldwork schedules, and other necessary logistics.



Figure 1. Map of the Philippines and the two case provinces (in blue circles) Image accessed at:

<http://www.accessintl.us/newaccess/images/bigmap.gif>.

The local people that I liaised with were the Provincial Veterinarians, who held managerial positions at the fieldwork sites (see Appendix A for sample copy of coordination letter sent to the Provincial Veterinarian of Benguet). This was advantageous to seeking access to the local communities at both the municipal and village levels. Upon arrival in the provinces, background meetings were held with the local contacts to discuss the objectives of my PhD research, and the specific aims of the ethnography study. Further, I consulted the local contacts regarding finalising the duration of my fieldwork and the details of my data gathering activities. I made sure that I discussed with them how would I go about engaging with the local people, identifying interview informants and specific sites or villages to visit, among other details necessary for 'entering' the fieldwork sites. Office staff were assigned as local guides to assist me in the field visits.

I devoted seven days to fieldwork in Benguet and eighteen days in Bohol, which included travel days to and from the Province. The specific context and field setting for the ethnographic study were determined early in the planning stage of my data gathering. I meticulously coordinated my data gathering activities, and scheduled the days to spend in each province in accordance with my local contacts' suggestions. It is important to note that I am familiar with the fieldwork sites from my previous communication research activities in my Master's degree, and professional work experience in animal health programs.

There were advantages as well as limitations in being accompanied by government staff. I deemed that the main contributions of being assisted by government staff were: eased my familiarity in the local communities; introduced me to potential study participants; and, provided logistical support in coordinating my data gathering activities (e.g. conduct of key informant interviews and field access to do my observation). On the other hand, as I was with government staff, I also consider that some of my study

participants may already have their biases with the government. These biases may have influenced their answers during interviews, or may have affected their ways on dealing with me or their actions especially upon noticing that they were being observed.

For my initial data gathering fieldwork, I accompanied the assigned local staff to observe and document their day's activities. These routine activities included attendance at community meetings and village animal health outreach activities. There were also instances where I coordinated visits to villages to observe and document the local setting. Some of the local sites were backyard farming households, livestock auction markets and abattoirs. My other data gathering activities involved immersion in local communities, and conducting individual and group interviews with village animal health workers or the BALA volunteers. Key informants were village animal health volunteers or BALA volunteers. There were 36 interviewees from the three group interviews and two individual interviews that I organised through the assistance of the PVO Bohol staff. The interview guide questions conformed to the context of the focus of the fieldwork sites. The questions pertained to specific local arrangements. The interview guide was flexible and modified to suit the appropriate local context being explored (see Appendix B).

During the interviews, I asked questions either in *Filipino* (the country's national language) or English or in a combination of both languages depending on the informants' preference. Although participants have their own vernacular language, which is *Bisaya-Cebuano* (for informants in Bohol), most informants could understand *Filipino* and English. In their responses, the informants answered in whichever language they were most at ease with. Therefore, although I am not proficient in the local vernacular languages, this was not a major limitation. Any necessary translation was undertaken by local staff or a guide, who were carefully selected for this purpose. All

interviews were audio recorded and had the informants' consent to record, which was verbally requested prior to the interviews.

Sorenson and Jablonko (2003) asserted that the use of visual documentation (digital video footage and photographs) as data is part and parcel of the ethnographic approach. These authors also argued that valuable visual information comes from natural events captured on film. They suggested three basic sampling techniques to increase the scientific value of visual records. These were:

- (1) opportunistic sampling - seizing every chance to shoot spontaneously any natural occurring phenomenon and taking advantage of events as they develop in unexpected settings;
- (2) programmed sampling – adopting a predetermined plan such as choosing in advance what, where and when to film based on a concept or cognitive framework;
- (3) digressive search – (also called semi-randomized) veering away from preconceived ideas and personal prejudgement that characterizes the two other strategies. This sampling approach turns from the obvious to the novel. It captures what may seem pointless or irrelevant, and can actively depart in both space and subject matter with the aim to change focus from the familiar and important to events that may be insignificant or incoherent.

During my fieldwork, appropriate verbal consent was sought before images were video recorded. Verbal consent was provided by the Benguet Provincial Veterinarian and the local people being filmed. I ensured my informants anonymity and confidentiality in presenting the data in my thesis. I recorded approximately five hours of video images in Bohol, and eight hours of video in Benguet in observing the field-site activities. However, filming of the events was done intermittently. This was because of the limited capacity to use the equipment on the premises. Another reason was that the filming

could have disrupted the nature of the events being documented. However, considerable visual images were taken without compromising the purpose of the field data collection.

Following a programmed sampling approach, two pre-selected field-site activities were the main features for the visual ethnography. The first was the *Cañao* ritual that is practised by indigenous Filipinos in Benguet, in the northern part of the country. *Cañao* is a "festival", a liturgy, or ceremony. It is a socio-religious ritual where animals, such as chickens, pigs, or carabaos (or buffaloes), are butchered and feasted on by the indigenous communities in the northern part of the Philippines. Historically, the purpose of the *Cañao* ritual is to drive away illness, ask favour for a good harvest, and for progress (Bolinto, 2013). I chose to observe the *Cañao* ritual, as it is an actual scenario where potential health risks and biosecurity concerns could be identified. In a *Cañao* ritual, pigs are butchered as a symbolic offering to the spirits. They are burned and cooked in open fire, and then eaten. Critical points in the procedure deemed as health risks and biosecurity concern were noted. The second field activity for the visual ethnography involved a local community activity in Bohol Province, which is the passing-on-gift (POG) ceremony that was institutionalised for the Province's animal dispersal-livelihood program. The visual ethnography of these two events will be discussed further in Chapter 5.

During the fieldwork I jotted field notes and insights on what I have observed in the field research sites (see Appendix C for sample field notes entry). These were cross referenced with interviews and government documents shared with me to enrich the data that I analysed. Table 7 summarises the field data-gathering timetable and activities I observed in Benguet and Bohol.

Field data organisation and interpretation. The video footages, interviews, and field notes were organized and appropriately labelled. The

visual data (i.e. video footage and photographs) were saved in the digital camera's built-in hard drive and backed up in external hard drives. The camera automatically assigned each video footage with a numeric label that was saved in the hard drives. A video shot list of the footages was created with the following details: label number; running time; date of fieldwork and location; context of the video and other details; description of the video; and, additional remarks (see Appendix D for a sample shot list). Out of the footages, still photos were captured and labelled with an assigned file name. These still photos are the visual images analysed and reported in Chapter 5.

Table 7

Summary of field work duration and activities in the provinces of Bohol and Benguet

Province	Duration of field work	Activities and sites observed/visited	Informants and interviews conducted	Visual documentation
Bohol	20 Oct to 6 Nov 2008 (NOTE: consultative meeting with OPV ProVet and staff was held in 15 Sept 2008 in Tagbilaran City)	- observed the 'passing-on-the-gift' (POG) ceremony ⁵ at barangay Cabog, Clarin - observed the ' <i>Bantay Rabies sa Barangay</i> ' (Rabies watch in the villages) briefing orientation and paralegal seminar ⁶ - observed the OPV staff planning and workshop on logical framework	- BALA volunteers	- POG ceremony held at barangay Cabog, Clarin
Benguet	17 to 23 Nov 2008	- observed the ' <i>Adivay</i> ' Provincial Agr-Fair ⁷ and the Grand ' <i>Cañao</i> ' ritual		- <i>Cañao</i> ritual and cultural program

⁵ Part of the OPV's sustainable livelihood and development programs collaborated by LGUs, POs and other NGOs, this ceremony was previously called "turn-over ceremony". It is highlighted by the actual passing on of gift animals to project cooperators, the giving of donor cards and reading the messages from the donors. The POG also symbolizes "baptism" as the animals are named after the donors purposely so that farmers are always reminded of the obligation to share the gift to others in need (2007 in Review, Province of Bohol, OPV, p.11).

⁶ Bohol Provincial Veterinarian, Dr. Stella Lapis (personal communication, October 22, 2008) explained that the OPV is spearheading this activity together with the Provincial Legal Office to promote awareness on the various policies and regulations (national laws and provincial ordinances) related to Rabies control. Bohol Province reported the highest incidence of Rabies cases in Region 7 hence strengthening its Rabies eradication campaign through stringent implementation of existing legislation.

⁷ Benguet Province celebrated its 108th founding anniversary which is called '*Adivay*' – an Ibaloi term meaning fun, getting together, celebration.

In Figure 2 the data interpretation and analysis framework used for the ethnography study is shown. Together with the background information, the visual data were described for any portrayal of: a) animal-human interaction; b) cleanliness and hygiene; and c) any other portrayal that may be relevant to contextual understanding of health risks and biosecurity. The analysis of the descriptions and interpretations of the visual information determined the socio-cultural and institutional characteristics that may contribute to the contextual understanding of health risks and biosecurity. Aside from the visual information, additional data sources included interview recordings, my field notes, and government documents.

Researcher stance as an observer and participant in the study. I took the role of an observer and I explicitly brought in my experiential knowledge as a communication specialist in animal health and veterinary public health programmes. Only on one occasion did I take part as an observer-participant during the simple *Cañao* ritual where I participated in partaking the meat from the ritual offering.

As a development communication practitioner and scholar, I brought with me throughout the research process my social constructivism world view, which values local understanding, community participation and engagement in a communication process to affect social change. My scholarly leanings, which I have explicitly discussed in previous chapters, and practical lessons I learned from working with various stakeholders in veterinary public health programmes, shaped my stance as a researcher.

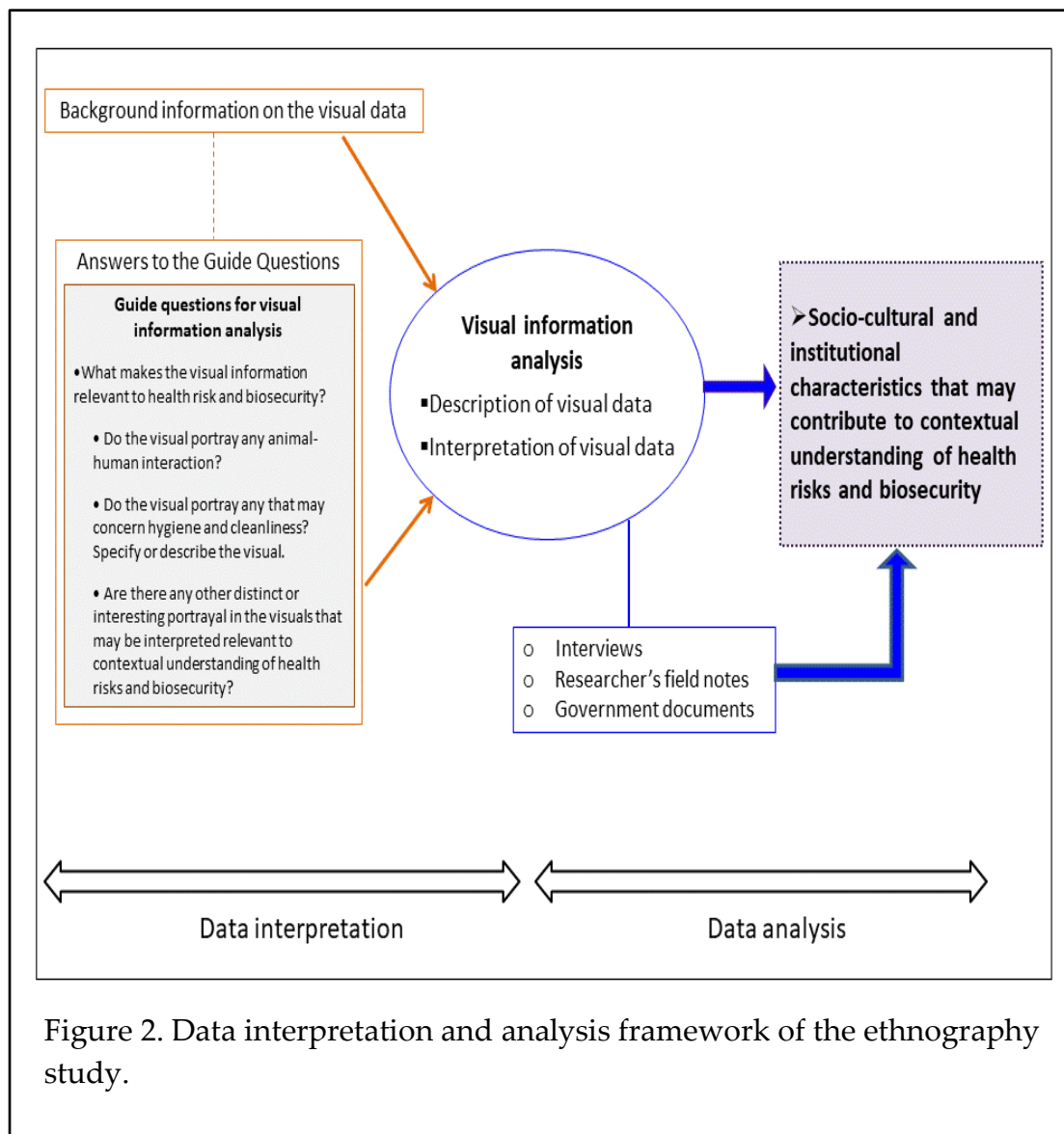


Figure 2. Data interpretation and analysis framework of the ethnography study.

My professional involvement in animal and public health programs in the Philippines, and other countries in Southeast Asia provided me with broad perspectives and exposure to practical situations in rural farming communities. I already had personal interaction with different stakeholders at varying levels – from international, national and local implementers of programs to beneficiaries in local communities. These experiential learnings contributed to how I interpreted the ethnography field data.

Case study of Singapore SARS outbreak

The experiences in dealing with the SARS outbreak in 2003 provided lessons on how to better respond to disease emergencies, and strengthened capacity for both developed and developing countries in dealing with an unknown disease. Communication has become integral to disease emergency response and prevention. During the SARS response, communication was vital in ensuring that knowledge about preventive measures were conveyed to the public, healthcare providers, the media, and other key stakeholders (Arguin, Navin, Steele, Weld & Kozarsky, 2004). One of the aims of this study is to analyse communication approaches adopted when addressing zoonotic emerging infectious diseases. To achieve this, a qualitative case study method was used to explore the institutional arrangements and communication approaches implemented during the height of a disease emergency scenario such as the SARS outbreak.

Qualitative case study method. A 'case' is implied as a spatially, delimited phenomenon observed at a single point or over a period of time, and is within the inference of a phenomenon that the study attempts to explain (Gerring, 2006). According to Yin (2003, as cited in Baxter & Jack, 2008) the following considerations could determine the use of a case study method:

The focus of the study is to answer 'how' and 'why' questions; you cannot manipulate the behaviour of those involved in the study; you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or, the boundaries are not clear between the phenomenon and context. (p.545)

There are different types of cases studies, namely a/an: explanatory case study; exploratory case study; descriptive case study; multiple-case studies; intrinsic case study; instrumental case study; and, collective case study (Baxter & Jack, 2008). I conducted a descriptive case study, which according to Yin (2003 as cited in Baxter & Jack, 2008) is employed when the aim is to "describe an intervention or phenomenon and the real-life context in which it occurs" (p.548).

In the next subsections, I will briefly discuss the background of the case or unit that I analysed in my study, which is Singapore's experience in dealing with the SARS outbreak in 2003. I discuss the institutional systems in place in relation to the communication approaches that were implemented. The data gathering procedure and interpretation for analysis of the scenario under study are also explained.

Background and characteristics of Singapore's SARS outbreak experience as a case study. Singapore's experience in managing an emerging infectious disease outbreak, of SARS, especially at that time when there was no clear information about the causative virus, was the phenomenon that I investigated in my research. In the case study, I closely examined the structure of, and interaction among, institutions involved, such as national government bodies, international and local non-government organizations, and industry groups on how key concerns were conveyed and interpreted, to determine what actions were taken in dealing with the SARS outbreak in 2003. One dominant area that I probed was the communication approaches adopted in addressing emerging infectious diseases, particularly in relation to the management of the

SARS outbreak. I examined the key institutions, their roles and the communication activities implemented at various stages of the SARS outbreak.

Data gathering procedure: Conduct of key informant interviews and review of published documents as secondary data. Initial coordination for a country visit to Singapore and to conduct interviews was done in November 2007. Letters requesting courtesy meetings and interviews were sent through email to the offices of the Ministry of Health, Agri-food and Veterinary Authority (AVA), and the Ministry of Information, Communication and the Arts (MICA). Only the offices of the AVA and MICA confirmed their availability for the meetings (see Appendix E for sample coordination letter sent to the Ministries in Singapore). The interviews were conducted between January 15 and 17, 2008 among key officials of AVA and MICA who were involved in and knowledgeable about the country's SARS outbreak experience in 2003. Guide questions for the interview were designed to mainly probe the existing national preparedness plan and guidelines on EID that included communication arrangements in place. Media management mechanisms in times of crisis/disease emergencies and instituting stakeholders' engagement were also explored. Specific details were asked about the different components and agencies involved and their roles in implementation. I also noted the interviewees' insights regarding the challenges and lessons learned as they managed disease outbreaks and prepared for any zoonotic EID (see Appendix F for the interview guide used in the study).

Aside from the key informant interviews, written or published texts were also collected as secondary data to support and/or cross-reference the qualitative information that was gathered from the interviews. The book *A Defining Moment: How Singapore Beat SARS*, published by Institute of Policy Studies and commissioned by Singapore's Ministry of Information, Communication and the Arts, was the main literature source.

Data organisation and interpretation. The interview transcripts were coded and categorised into topical themes that detailed what arrangements were in place in Singapore. The data from the key informant interviews and relevant literature as secondary sources were analysed using thematic analysis. The process of thematic analysis is the identifying of themes from the data that captures the meaning relevant to the research question, and linking the themes that surfaced (Willig, 2014). I deduced from the available data, the rationale which explained the scenario and arrangements in Singapore during the SARS outbreak. I determined the mechanisms used to manage EID disease emergencies. I also identified:

- a. the key proponents to address disease emergency situations and how they were intended to operate;
- b. key messages and how these messages were communicated to different stakeholders;
- c. challenges experienced during the outbreak and how these were resolved; and,
- d. lessons learned that contributed to improving the disease emergency preparedness and response.

Systematic literature review of One Health and Ecohealth

A systematic review is used to identify and synthesise all scholarly research on a particular topic. It is a methodical and comprehensive literature synthesis that is focused on answering well-formulated research questions (Cornell University Library, 2018). In healthcare, systematic reviews are beneficial among clinicians to keep themselves up-to-date in their field. It is also used as a basis for developing guidelines or protocols, and in justification for research grants (Moher, Liberati, Altman, The PRISMA Group, 2009). In contrast to a traditional literature review of which the general aim is to determine the scope and describe the literature about the topic of interest, a systematic

literature review prescribes a systematic methodology and is focused on reviews of evidence-based practice (Jesson, Metheson, & Lacey, 2011).

In this part of my study, I employed a systematic literature review for two reasons. The first was to support my research aim of providing an integrated communication framework. The second, was to highlight the relevance of the field data I gathered during the early parts of my research to the current landscape of addressing zoonotic infectious diseases from One Health and Ecohealth approaches. The research questions that I attempted to answer in the systematic review are: a) what is the trend of social science research-focused studies in One Health and Ecohealth, particularly in communication, from 2004 (post-SARS) to 2018? b) what are the emerging themes in the literature that capture the relevance of communication in One Health and Ecohealth?

Procedure in selection of the literature, inclusion and exclusion criteria, and analysis. I used Scopus and Web of Science databases to search for multiple and interdisciplinary peer-reviewed articles and other publications. I also explored the online resources in the OIE and FAO AGRIS (International System for Agriculture Science and Technology) websites. In using these databases and online resource websites, my literature search was limited to: (i) English language; (ii) final publication from 2004-2018; (iii) articles, conference papers, meetings, editorials, case reports, and short survey documents. I used the Boolean logic operators “OR” and “AND” with the following key words in my search: (i) One Health; (ii) Ecohealth; (iii) zoonoses; and, (iv) communication.

I adopted the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) flowchart as my guide in completing the systematic literature review as seen in Figure 3. I initially generated 1,130 references: 1,033 records from the two databases; and, 97 records from the FAO AGRIS and OIE resources. I saved all records in EndNote (version X7) and cleaned the records specifically for duplicates. Nine hundred and thirty nine (939) records were left to be screened after excluding 146 duplicate records in the databases, and 45 duplicate

records in the online resource websites. I read through the abstracts of the 939 records, and sorted which literature would be included in my study.

I assessed each abstract based on the following inclusion criteria:

- a) the concept of One Health, Ecohealth, or its related concerns (such as zoonoses, public health, environment health, and wildlife conservation) were explicitly articulated;
- b) significantly centred on exploring communication aspects pertaining directly to One Health, Ecohealth, or its related concerns (rather than merely mentioning communication as a strategy or part of the recommendation).

Using these two main inclusion criteria, 39 articles were assessed for eligibility. However, 24 articles were excluded for two main reasons. First, the inaccessibility to generate a copy of the full articles (three articles). Second, upon reading the article there was the lack of detail on a communication-centred aspect in One Health, Ecohealth, or its related concerns (24 articles). Although these excluded articles discussed related concepts in communication such as participation, community engagement, empowerment or knowledge-sharing, the central focus of the article was not on communication, but mostly as inter- and transdisciplinary or from other social science fields, such as socio-politics and participatory research.

The results from the literature search were reviewed qualitatively and analysed using descriptive statistics (frequencies and percentages) that described the trend of communication-focused studies in One Health and Ecohealth. Thematic analysis was also conducted which generated the literature themes related to communication in One Health and Ecohealth. I discuss the findings in Chapter 7.

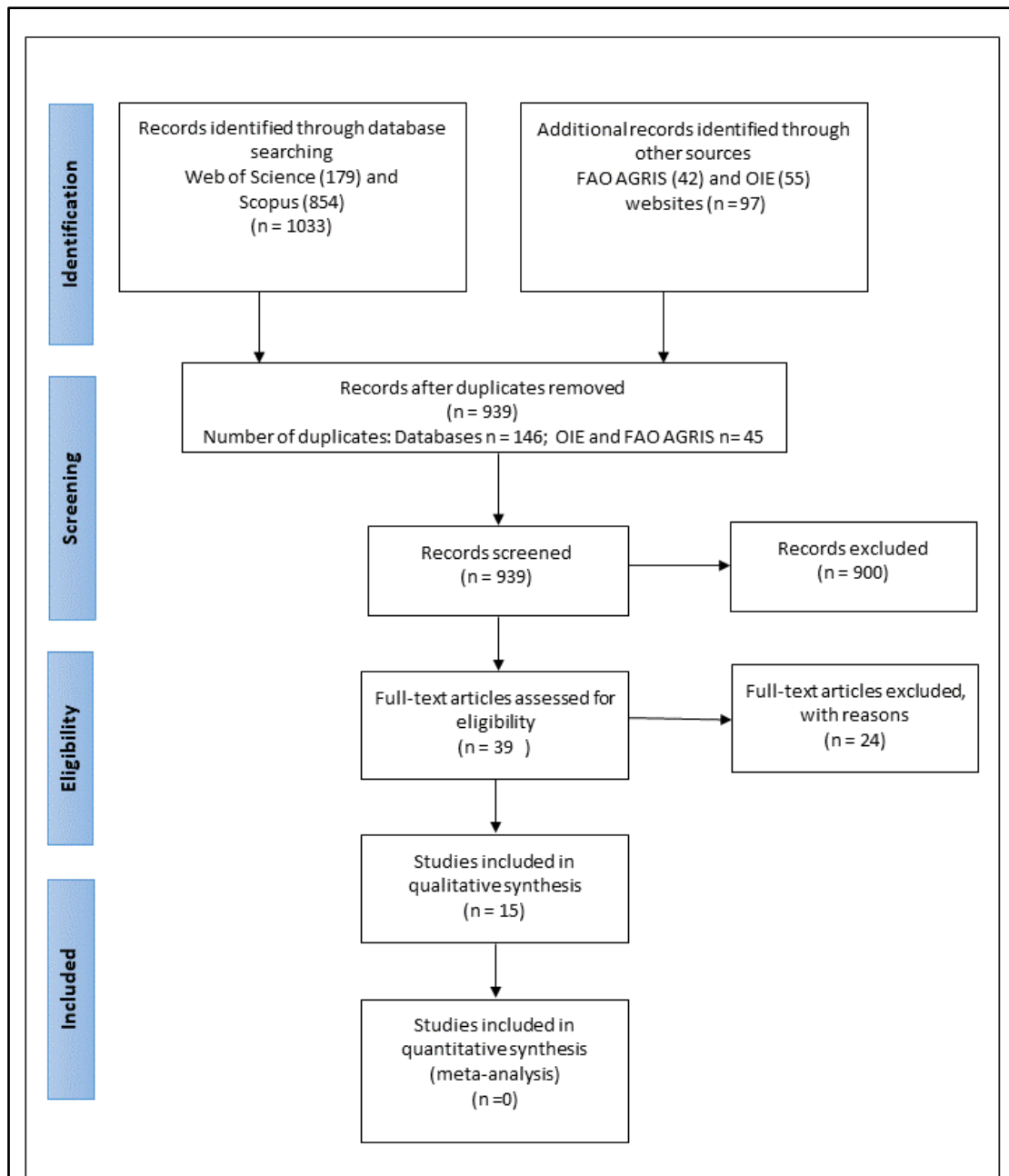


Figure 3. PRISMA (Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., and The PRISMA Group, 2009) flow diagram used for systematic literature review on One Health/ Ecohealth and communication.

Conclusion

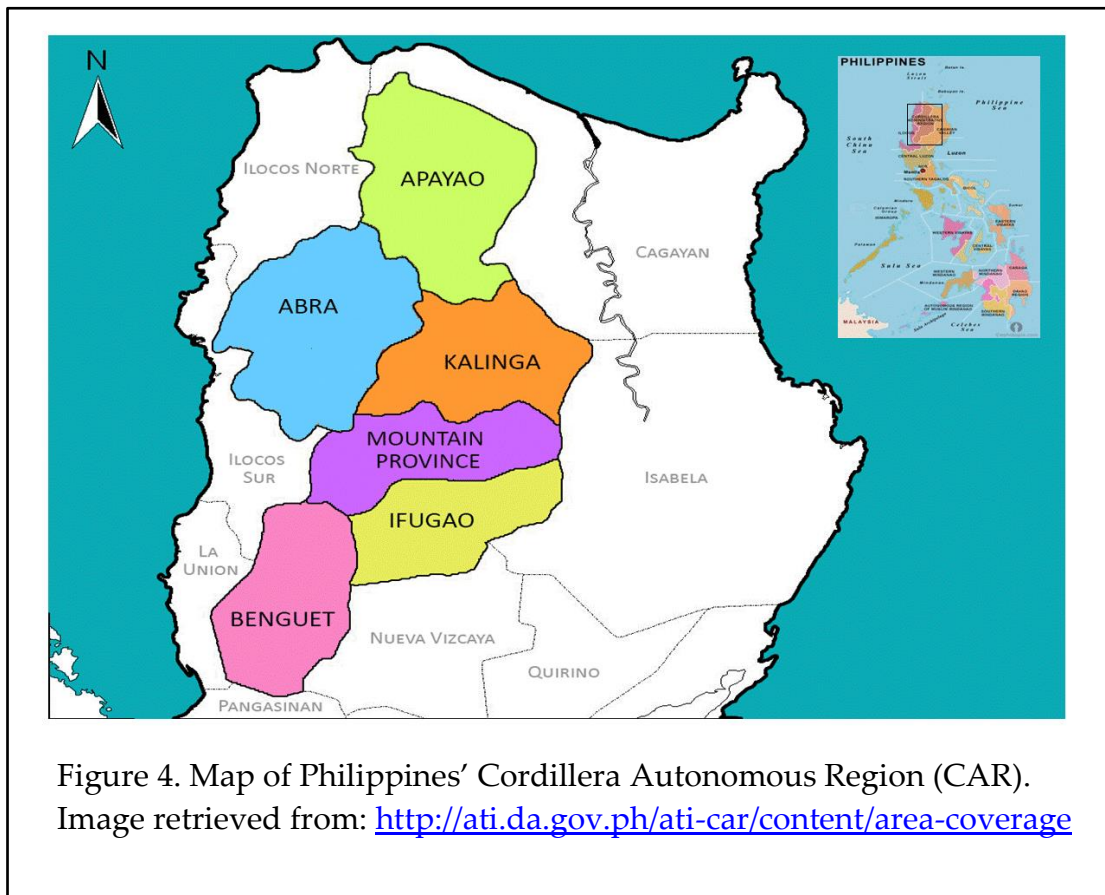
In this chapter, I have described the methods used to respond to the research questions and provided the reasons as to why I selected these methods. I present the results of each phase of this study in the following chapters. The next chapter documents my observations from the ethnographic fieldwork. Chapters 6 and 7 report the results from my case study of the communication management of the SARS outbreak in Singapore and the findings from the systematic literature review on communication in the One Health and Ecohealth literature.

Chapter 5: Contextual understanding of health risks and biosecurity: An ethnography study of selected sites in the Philippines

Introduction

I have asserted in previous parts of my thesis, specifically in Chapter 3, that social, cultural and institutional drivers need to be recognised as crucial for effective communication. Recognising contextual understanding of health risks and biosecurity, especially in Asian societies, may lead to identifying the appropriate communication approach. In this chapter, I describe and analyse two cases that I investigated in 2008 for this PhD research, in selected communities in the Philippines. The first case is the cultural practice of *Cañao* ritual in Benguet Province, which is located in the northern part of the Luzon archipelago (see Figure 4 for the map of Cordillera Autonomous Region (CAR) where the Province of Benguet is located). The ceremony that I observed for this research was the *Cañao* during the celebration of the 108th Benguet founding anniversary in November 2008. Part of the field data I gathered and analysed for the first case study were photographs capturing the conduct of the ritual, which included animal slaughter. Some of the photographs shown and graphic description in my research findings pertaining to the animal slaughter may bring discomfort to some readers of this thesis.

The second case is the Barangay Livestock Aide (BALA) Program being implemented by the Office of the Provincial Veterinarian (OPV) in Bohol Province, which is located in the central part of the Visayas archipelago. These two cases are the main components of this chapter, where socio-cultural and institutional characteristics that may contribute to contextual understanding of health risks and biosecurity are identified, and which are crucial to developing an effective and integrated communication approach.



Case study 1: *Cañao* ritual

Research interest on *Cañao*. I first knew about *Cañao* from my primary school text books. From what I learned in school, *Cañao* is one of the rituals to help ensure a bountiful harvest or as a means of celebration by indigenous people from the north, particularly in the Cordillera Autonomous Region (CAR). The Provinces of CAR include Abra, Apayao, Benguet, Ifugao, Kalinga and Mountain Province.

People from this region are generally known as *Igorots* but they are classified into different ethno-lingusitic groups—*Isneg* (Apayao), *Kalinga*, *Bontoc*, *Ifugao*, *Kankanay*, and *Ibaloy* (Scott, 1974). My deeper awareness of their indigenous practices and wider experience in interacting with the indigenous people in CAR happened even before I began this PhD research. Between 2000

and 2003 when I was working as a Communication Specialist in the AusAID-FAO supported, National FMD Control and Eradication Project, I went to the provinces of CAR, where I worked with local government staff and community media practitioners to plan, coordinate and implement public awareness activities concerned with FMD control. During the numerous trips I made, and the days I travelled in the provinces of CAR over a three-year period as a Communication Specialist, I observed the unique traditions of the local people, and how these had become part of their everyday lives. The practice of *Cañao* and other rituals were part of their rich cultural tradition.

During my work, I became very interested in exploring social and cultural aspects in communicating animal health and veterinary public health concerns. For this PhD research, I was keen to look closely at *Cañao* while conscious that the ritual involves human-animal interaction, which is crucial to dealing with health risks and zoonotic diseases.

Swine raising by the Igorots, and *Cañao* of the Ibalays. While involved with the AusAID-FAO FMD Control and Eradication Project (or FMD Project as I refer to hereafter), I learned that backyard swine raising was a source of additional income for households of poorly-resourced families. Often, the profit made from selling their pigs would be used for payment of their children's school fees. This was also the case for some of the households in CAR, but another reason for raising pigs in this area was that it is culturally ingrained. This practice was documented in an ethnography account by Dominican friar Francisco Antolin in 1795 during the Spanish period (Scott, 1974).

Their main meat was pork, and they grew hogs so fat that their bellies dragged the ground, but wanted cows and carabaos for more prestigious banqueting during festivities. Herds of 20 or 30 were to be found in Benguet and the people of Ambuklao capitalized on local grasslands by pasturing cattle on commission for other villages. But they generally did not breed these animals—for reasons of religious taboo, Father Herosa

said — so their rate of consumption made them one of the major items of highland-lowland commerce at three or four pesos per head. (p.177)

During the time I was involved in the FMD Project, I became aware of local swine raising practices relevant to FMD control. One of these practices was that of local backyard swine raisers feeding *kaning-baboy* or swill to their pigs. Swill is kitchen refuse, such as leftover table food and vegetable trimmings that could be fed to pigs. Swill feeding is an identified FMD risk, so this practice is not recommended. However, because it was a local practice that would take local pig raisers time to change, if at all, a pragmatic alternative was advocated. A key message that is part of the public awareness activity, was to cook and boil the swill for 30 minutes before feeding this to the pigs. The recommendation may have inconvenienced the animal raisers, but it was doable. We could not convey a message to stop swill feeding, as this has long been practiced, but providing messages that allowed an alternative (such as cooking and boiling swill for 30 minutes), that was close to the intended behaviour (control FMD-spread), and that could be easily understood and performed by the livestock raisers was the better alternative.

As mentioned earlier, raising pigs in CAR, especially in the household backyard, has cultural significance as animals are used as sacrificial offerings in indigenous rituals. Pigs are the most sacred animal worthy of ritual offering, but not all pigs are considered sacred. The indigenous people believe that black-coloured or spotted-black pigs are the most pleasing to the spirits and bring greater fortune than any other coloured pigs. It is also important that the pig to be sacrificed is *pa'to'bo* or raised at home. Other animals like cows, carabaos (or buffaloes), and horses are not offered, but are butchered to augment the meat of the sacrificed pig that will be shared among the members of the family and community (Perez, 1979).

Cañao is the general term used for feast and used specifically by the *Ibaloy*s, the ethno-linguistic group of the people living at my study site in Benguet Province. The indigenous people believe that *Cañao* is performed to cure sickness, appease an angry spirit, or satisfy the desires of a dead ancestor. It is also believed that *Cañao* can bring blessings and good fortune such as wealth, children, and a bountiful harvest. Sharing one's wealth and blessings with the people in the community is also a purpose of the *Cañao* ceremony. The *manbunong* or native priest officiates at the *Cañao*, which is dependent on the purpose of the ritual and the socio-economic status of the celebrant. Therefore, the ritual can be grand or simple. A simple *Cañao* would need at least one pig butchered, a jar of *tafey* or rice wine, and the cooking of rice, and root crops like taro and sweet potato. In a grand *Cañao*, greater numbers of pigs or different types of animals would be butchered, such as cows, carabaos and horses as a greater number people partake in the ceremony. Before the *Cañao* the celebrant would prepare: first, the animals to be sacrificed; jars of *tafey*; musical instruments if the *manbunong* had prescribed dancing during the ceremony; makeshift eating places (especially if the *Cañao* would be held over several days); a place for butchering the animals, which is usually in the household's backyard or an open space; and the *sap'sap* [an Ibaloy term] or *runo* plant [indigenous plant found in CAR] to cover the ground where the meat is to be cut (Perez, 1979).

Adivay 2008: *Cañao* and the cultural program. In *Ibaloy*, the word *Adivay* means 'coming together to have fun' (Province of Benguet, 2008). The "Adivay 2008" was a month-long celebration with scheduled activities (see Appendix G for the program of activities). I observed two ceremonies during the *Cañao* and cultural program, held on November 21 and 22, 2008. These ceremonies were performed in celebration of the Province's founding anniversary. The first ceremony was held on the evening of 21 November 2008, which was attended by Provincial leaders (headed by the Governor), staff and their guests. I refer to this ceremony in this chapter as the simple *Cañao*. The second ceremony was held the

following day on 22 November 2008, was witnessed by more people and by representatives from the different municipalities. This ceremony is referred to as the grand *Cañao*. In the next subsections, I describe the ceremonies that I captured visually. The quality of the photos may not be ideal as the images were not captured in the best lighting condition, especially those that were documented in the evening. I opted not to use a camera flash for extra lighting as I was conscious not to interfere the ritual in its natural setting.

Simple Cañao. Two black-coloured pigs with their feet tied were brought to the area where the ceremony was to take place. One man held one of the pigs and two men, the other. These men restrained the pigs as they prepared for the *owik* or the butchering of the pigs as sacrificial offerings for the ritual (Figure 5). The *manbunong* was seated facing some of the provincial leaders and guests as he prepared to officiate over the *bunong* or the performance of the ritual chants. Beside the *manbunong* was a banquet table. On top of the table was a jar of *tafey*, coconut shells used as cups for drinking the *tafey*, and indigenous cloths that were used as part of the ritual (Figure 6).



Figure 5. Restraining the pig.



Figure 6. Image of the *manbunong*. The *manbunong* seated beside the banquet table, facing some of the guests as he does his ritual

The *bunong* began, and upon a cue from the *manbunong*, four more men approached the tied pigs, and the *owik* commenced. Two of the men simultaneously slit the ribs of the pigs close to their hearts using a *bolo* (big knife). They then inserted a wooden peg with sharp ends (*uwik*) through the cut skin into the pigs' bodies. Aiming at its heart, the men poked it until the pig was immobilised. The other men were tasked to restrain the pigs until they expired (Figures 7 and 8). After the *owik*, each pig was carried by four men to the cooking open area. The pigs were grilled one at a time (Figure 9). While grilling, a couple of men took turns in scraping off the hair from all sides of the pigs' skin using bamboo planks. After 10 minutes or so on the grill, the pig was set aside and placed on a pile of *runo* leaves. Water was poured over the pig. The men continued to scrape the hair and charred skin from the pigs' bodies (Figures 10, 11 and 12).



Figure 7. Men doing the *owik* or pig slaughtering.



Figure 8. Image of the *uwik*. One man holding an *uwik* (image circled) or wooden peg with sharp ends. The term *uwik/owik* may have been derived from the *Ibaloi* term *tuwik* which means



Figure 9. The pig was brought to the cooking open area for grilling.



Figure 10. Men took turns in scraping off the hair from the pig's skin using bamboo planks.



Figure 11. The pig was flipped on all sides to scrape off the hair skin.



Figure 12. Procedure after grilling. After grilling, water was poured over the pig's body (note that it is usual in the Philippines to recycle big containers, such as seen in this photo, and use it as pail to draw water).

After the hair and charred skin was scrapped off, the pigs were brought back to the slaughtering area, which was covered with *sap'sap* or *runo* leaves. The leaves prevented the meat from touching the floor. One of the men cut open the pigs, took the liver and gall which were placed in an open container. The rest of the internal organs were also taken out (Figures 13 to 18).



Figure 13. Men scraping off the hair. After water was poured over the pig's body, men continued to scrape off the hair from the charred skin.



Figure 14. Procedure after the hair scrapped off. The men moved the grilled pig (with its charcoaled skin and hair scrapped off) back to the slaughter area. The floor was covered with *runo* leaves or *sap'sap*.



Figure 15. Men exposed to the pig's internal organs. One of the local men removing the pig's liver from its opened body.



Figure 16. Pig's body cut open, and internal organs were taken out.



Figure 17. Pig meat. Some of the pig meat after all the internal organs were taken out.



Figure 18. Men cutting the pig meat into portions of different sizes.

The liver and gall from the two pigs were brought to the feet of the *manbunong*, who closely inspected them while performing ritual chants. The *manbunong* interpreted the meaning of the size and formation of the liver and gall of the animals that were offered, as discerned by the spirits (Figure 19). The *manbunong* predicted the future of the celebrants present (for this *Cañao* the celebrants were the Provincial leaders/ government) from what he had sensed from the spirits. The *manbunong*, during his ritual chant, prophesied bountiful blessings and protection of the leaders and staff of the provincial government in the future.



Figure 19. *Manbunong's* interpretation. The *manbunong* explaining to the guests the meaning/message he discerned from the offered pigs' liver (image is circled).

After the *manbunong*'s ritual chant, he poured *tafey* from a coconut shell over the pig's liver as part of the offering ritual (Figure 20), then passed the coconut shell with *tafey* to the Provincial Governor, who in turn passed it to the other leaders who were part of the ceremony (Figure 21).

Coinciding with the *bunong* was the preparation and cooking of the pig meat. A cooking area with two parts was set up. One part was in an open space with a wood-fired grill. A *talyasi* (an iron vat used for cooking) full of boiling water was placed on top of a wood-fired cooktop in the other part. There was also a separate indoor kitchen/cooking area where boiled rice was cooked and the cooked meat was prepared before placing it on the banquet table. The pig meat was chopped into various sizes and then brought back to the open space cooking area to boil until it became tender. The pork meat was then brought to the indoor kitchen where it was flavoured with salt, and prepared for the banquet.

The local women prepared the banquet table by placing plates of cooked rice and a large container of pork meat on it. The *manbunong* went over to the cooked food and continued his ritual chanting in an effort to please the spirits with this bountiful offering. The ceremony concluded with the provincial leaders, staff and guests (I was one of these) consuming the pork and rice. Figures 22 to 27 were the rest of the visuals in which the simple *Cañao* that I observed was captured.



Figure 20. Ritual offering. The *manbunong* poured *tafey* on the liver (image is circled) as part of the offering ritual while he continued his ritual chants.



Figure 21. The ritual of drinking *tafey*. The *manbunong* passed the *tafey* in a coconut shell (image circled on the top-left photo) to the Governor (image on top-right), and after drinking, he passed it to the other leaders and guests (images below).



Figure 22. Some of the local women preparing the banquet table.



Figure 23. The open space cooking area, where the pig meat was grilled and boiled: a) the *talyasi* or iron vat used for cooking; b) one of the locals was about to put the big chunk of pre-grilled meat (image circled) in the container with boiling water; c, and d) another person was grilling the other portions of meat.



Figure 24. The *manbunong* doing his ritual chants fronting the set up banquet table for the ceremony.



Figure 25. The *manbunong* offering while doing his ritual chants. The *manbunong* offering the cooked rice, pig meat and *tafey*.



Figure 26. One of the local women giving out the cooked meat to be eaten by the locals and guests.



Figure 27. The cooked meat shared by everyone in the *Cañao* ceremony.

Grand Cañao. This ceremony was held in a larger space at the provincial sports centre, and was observed by many onlookers. There was a designated emcee facilitating the structured program of this cultural ceremony. In contrast to the previous night's ceremony, where the two pigs to be offered had been pre-selected, this time, men representing each municipality had to catch their share of the pigs to be offered. In *Ibaloy*, this was termed *avang* or *depap*. The day before the ceremony, there were already a number of black-coloured pigs in a holding pen at the provincial sports ground. In the morning, before the ceremony started, more pigs were brought in and retained in the holding pen. There were eventually about 15-20 pigs inside the holding pen and from here the men caught the pigs they were going to offer.

As a prelude to the actual *avang* or *depap*, about 13 men representing the municipalities entered the holding pen and began approaching the pigs. More men entered the holding pen to help catch their pig offering. About three to six men would work together, run after one pig, restrain it and tie its feet together. The tied pigs were then lined up outside the holding pen. Two men moved each of the tied pigs (by hanging it on a long bamboo pole inserted between the tied fore- and hindquarter feet) to the designated ritual ceremony area.

The *Cañao* and cultural program began with a prompt from the emcee. The *manbunong* was seated in the ritual ceremony area, with jars of *tafey*, indigenous cloths, and other materials needed for the ceremony beside him. Provincial officials gave their welcoming addresses and messages in celebration of Benguet's founding anniversary. After the formal speeches and a signal from the emcee, the *avang* or *depap*, men representing the municipalities raced over to the holding pens to catch their share of pig offerings and bring them to the ritual ceremony area. The men (three - six members representing the municipalities) restrained and tied the pigs. While the men were settling their pigs, the *manbunong* recited ritual chants and the *bunong* commenced, followed by a *tayao* or ritual dance. The Provincial Governor and his wife lead the ritual dance

followed by the other officials. They wore indigenous clothes on top of their modern clothes as they danced to the music played on their traditional instruments. They performed the ritual dance as they encircled the black-coloured pigs to be offered. After one couple completed a circular dance motion they drank *tafey* from the bamboo husk cup, and would be replaced by new couple-dancer who performed the same routine. The *manbunong* would recite his ritual chants from time to time while the ritual dance was performed. There were also some parts where the locals would respond to the chants of the *manbunong*.

After the Provincial leaders had finished dancing, the *owik* followed upon a signal of the emcee. Representatives from each municipality were asked to raise their *uwik* in the air once the pig has been immobilised. The pigs were then slaughtered. Each municipality was provided with their own space to continue their celebration. Figures 28 to 37 were visual images of the grand *Cañao* that I observed.



Figure 28. The *Cañao* and Cultural Program. Dignitaries headed by the Provincial Governor were on stage during the opening programme of the *Adivay* 2008 *Cañao* and Cultural Program held at the Benguet Sports Center, La Trinidad.



Figure 29. Pigs for the *Cañao* ritual. Black-coloured or black-spotted pigs inside the holding pen at the Benguet Sports Center grounds during the *Adivay* 2008 celebration. Onlookers surround the pig pen as they wait for the start of the *Cañao* and cultural program.



Figure 30. Men were unloading more black-coloured pigs from the truck to the holding pen.



Figure 31. Preparing for the *avang*. Men were inside the holding pen preparing for the *avang* or *depap*, which was the catching of their share of pigs for the ritual offering.



Figure 32. The *avang* or *depap*: a) men were pinning down the pigs; b) one of the men was tying the feet of the pig (image circled).



Figure 33. Continuation of the *avang* during the Grand *Cañao*: a) Men representing each municipality raced towards the holding pen; b) Men tried catching their share of pig for the offering; c) Men pinned down the pig and tied its feet; d) Tied pigs were arranged at the ritual ceremony area as the men listen to the *manbunong*'s chants.



Figure 34. The *manbunong* at the Grand *Cañao*. The *manbunong* (seated) talks to one of the women elders as they wait for the prompt to begin the *bunong* at the ritual ceremony area.



Figure 35. One of the locals prepared the *tafety* for the ritual.



Figure 36. Provincial leaders lead the *tayao* or ritual dance. The governor and his wife (top photo) performing the *tayoa*.

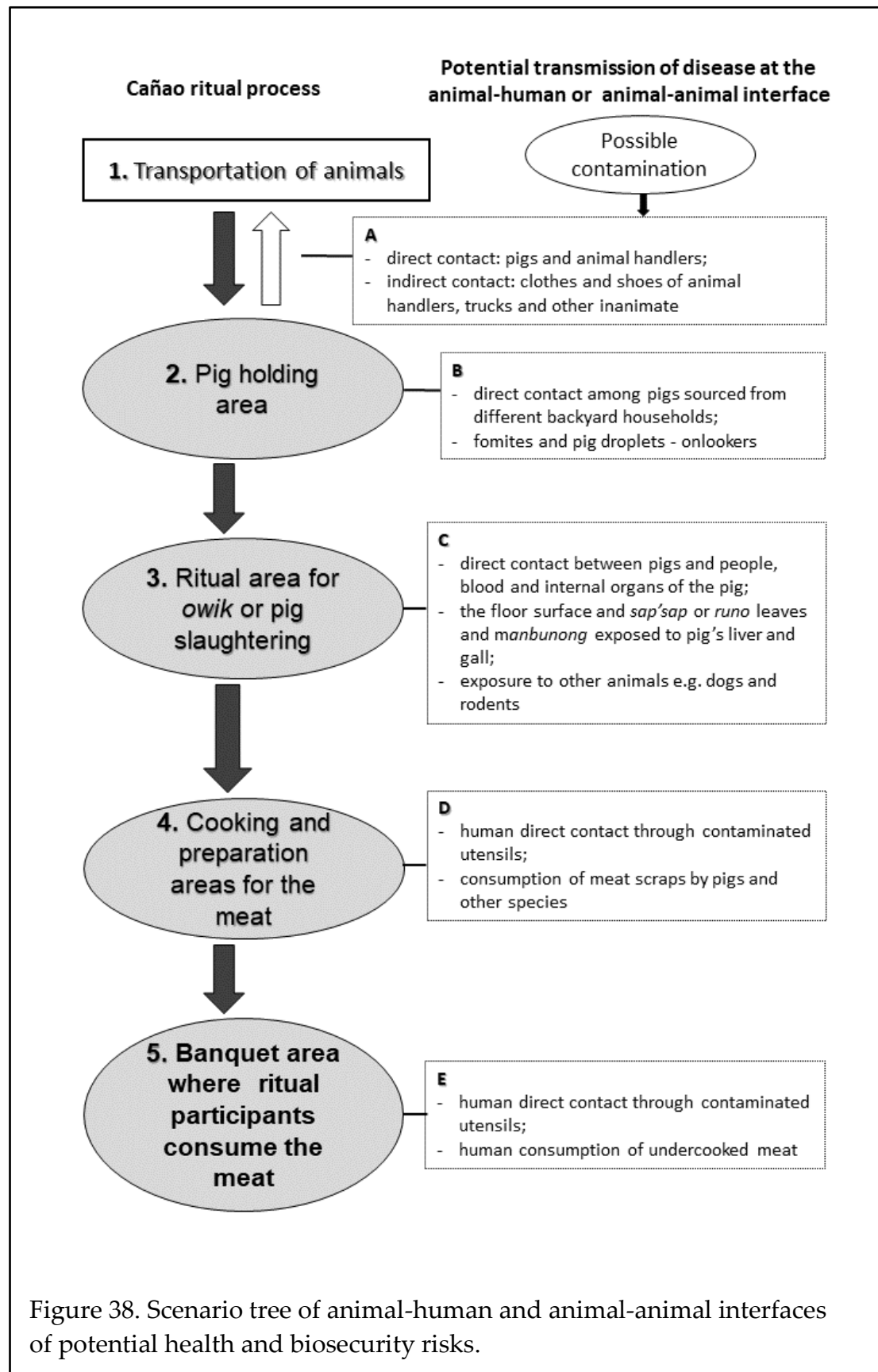


Figure 37. The owik ritual: a) the men prepare for the simultaneous owik; b) while two men restrain the pig, one was slitting the skin of the pig near the rib, close to its heart (image circled); c) the men raise their uwik as they wait to be prompted to start the simultaneous owik; d) one of the men pokes the heart of the pig until it expires, while the other two men restrain the pig.

In comparing the two ceremonies I observed, the simple *Cañao* was more solemn as it was performed among an intimate crowd. The grand *Cañao* catered to a larger group that necessitated entertainment in doing some parts of the ceremony. For example during the *avang* or *depap*, the men had to race to catch their share of pigs. However, despite the differences between the two ceremonies, the symbolism and the rich cultural tradition of the *Cañao* was upheld.

Potential health risks and biosecurity in the Cañao ritual. The previous section described my observations of two *Cañao* ceremonies that I witnessed on November 21 and 22, 2008. In this section, I will discuss my analysis of the *Cañao*

ritual process where I identified critical points of animal-human and animal-animal interactions that would be potential health and biosecurity risks. In a scenario tree that I created (see Figure 38), there are five main critical points or areas, these are: transportation of animals; the pig holding area; the ritual area for the *owik* or pig slaughtering; the cooking and preparation areas for the meat; and, the banquet area where ritual participants consume the meat. At the first critical point, during the transportation of animals, the pigs would have direct contact with the animal handlers. Indirect spread could also be possible through the clothes and shoes of animal handlers as well as the trucks and other inanimate objects present during transportation. The second critical point is the pig holding area where the animals are kept until they are all slaughtered for the ceremony. In the Grand *Cañao* that I observed some of the pigs had been transported earlier that day and had stayed in the pen for some time. A newer batch of pigs were brought in just before the ceremony started, and were mixed with the other animals. These pigs came from different backyard households, a potential biosecurity risk.



Also within the premises, the local onlookers gathered around the pen while waiting for the ceremony to start. They are potentially exposed to zoonotic pathogens through fomites and pig droplets. The third critical point, I identified is the ritual area for the *owik* or pig slaughtering. At this point there are a number of ways that direct contact and contamination may lead to health and biosecurity risks. Men tasked to slaughter the pigs have direct contact with the blood and internal organs of the animals. There is also a possibility of direct exposure for the *manbunong* as during a part of the ritual he may handle the pig's liver and gall. Further, the ritual area is usually an open space. The surface of the floor where the *sap'sap* or *runo* leaves are spread out may be a point of contamination. Exposure of other animals, such as dogs and rodents is also possible. At these three, above-mentioned, critical points there is the possibility of spread of diseases such as:

- transmissible animal diseases, e.g. Porcine Reproductive and Respiratory Syndrome (PRRS), Classical Swine Fever (CSF), swine influenza, porcine cirovirus, and swine erysipelas
- zoonotic infectious disease, e.g. swine influenza, leptospirosis, and rabies (because of dogs being present in the area)

The fourth critical point is the cooking and preparation areas for butchered meat, where the possibility of the disease spread is possible, as well as the risk of food safety. Contamination is plausible, especially if the people handling the pork do not follow appropriate hygiene measures, or the utensils used for the food preparation are not properly sanitised. Meat scraps that are undercooked and unsafe for consumption, may be consumed by humans, pigs (which goes to the swill that I cited in the earlier part of this chapter) and other species. The final critical aspect that I identified is the banquet area where the ritual participants gather together to eat the cooked meat. This last critical point also poses a risk for food safety through contamination of utensils and consumption of undercooked meat. *Trichinella spiralis* (pork roundworm), *Taenia solium* (pork tapeworm),

several species of *Salmonella*, coliform bacteria (in water), and several species of *Campylobacter* (in the gut and faeces of animals) are some of the possible contaminants or food safety threats.

My reflection and analysis of the *Cañao* ritual relevant to contextual understanding of health risks and biosecurity. The possibility of disease spread and food safety risks is apparent in the *Cañao* ritual. I reflected on my observations of the ritual and infer three main socio-cultural contexts to be considered in understanding health risks and biosecurity. I discuss these contexts in the succeeding sections.

Sourcing and movement of the pigs used for offering. It is ingrained among the *Iballoys'* cultural beliefs that black-coloured pigs are the only ones acceptable as animal offerings. It is also preferable that the pigs have been raised in their owner's backyard. Animal health policy makers need to consider this cultural practice when constructing local and context-specific policies. For instance, it is important to know where the native or black-coloured pigs are sourced, and that the movements of the animals from the source to the place of slaughter are monitored. From my work experience during the FMD Project, I am aware that the pigs were only sourced within the Province. However, with urban development, backyard swine raising was prohibited in some parts of the Province, thus limiting the households that could raise pigs in their backyard. This may result in people sourcing the required black-coloured pigs from other near-by areas. Another point to note was the need for information regarding possible exposure of the pigs to other wildlife species while being raised for slaughter. I have not specifically probed this in my study, but with the emergence of Nipah virus, for instance, the pigs infected with this virus had been exposed to bats that were the vector for the virus. The health status of the animals prior to being used for the ritual offering should be assessed. This is to ensure that the pigs are disease-free and minimises the risk of any disease transmission, between these animals and humans.

Sanitation of the materials used in the rituals. Douglas (1966/2005) wrote: “There is no such thing as absolute dirt: it exists in the eye of the beholder” (p.2). The concept of cleanliness or hygiene is indeed relative. In my observations of the *Cañao* ceremonies, there were instances that made me question the local people’s awareness of basic sanitation measures. The fact that the ceremony was performed in the open and in a somewhat uncontrolled space meant the risk of microbial contamination was a reasonable possibility. Another observation, which I captured in some of the visual images, was that the local people recycled containers of cooking oil, and used these as a bucket to hold water that was poured over the pig (as shown in Figure 12) or as containers for the butchered meat, cooked and uncooked (as shown in Figures 17 and 18). It was possible that the recycled containers were not thoroughly cleaned prior to, and during the time they were used for the ritual. It is quite common in Filipino culture to recycle containers, especially if they look fancy or seem to be functional with regard to size or durability. Whether they are thoroughly sanitised before re-use is, however, an ambiguous practice. The risks may be partially mitigated by the effect of sunlight on inactivating infectious disease agents. One reason for lack of sanitisation could be the lack of, or inaccessibility to clean water. There are still some areas in the Philippines, such as in Benguet Province where accessing clean water is still a challenge and dependent on the geographical situation, for example, whether you are using water from upland or low-lying areas (Lynas, et al., 2014). Given my observations, people’s understanding of hygiene and cleanliness vary, and could be a socio-cultural, or even a socio-economic construct related to poverty. This is an important point to consider in relation to examining how people understand health risks.

Exposure to and handling of the animals. The human-animal interface is very much evident in the *Cañao* ceremonies. In the *owik* part of the ritual, the exposure and handling of the pigs’ blood and internal organs is a health risk. Infectious agents such as viruses, parasites and bacteria may be contained in the

animals' blood and internal body parts, which the local people would then be exposed to. If the animal is sick, it could be the source of direct disease transmission. Indirect modes of disease transmission are also possible in this scenario. For example, viruses can linger on fomites (inanimate objects capable of carrying disease) such as clothes, shoes, and utensils, materials that were used in the *owik* ritual. These fomites need to be properly cleaned and disinfected to prevent spread of infectious agents. It is my view that awareness alone about cleaning and disinfection is not sufficient. Alternative practices supported by an enabling environment to adopt the practice could be introduced.

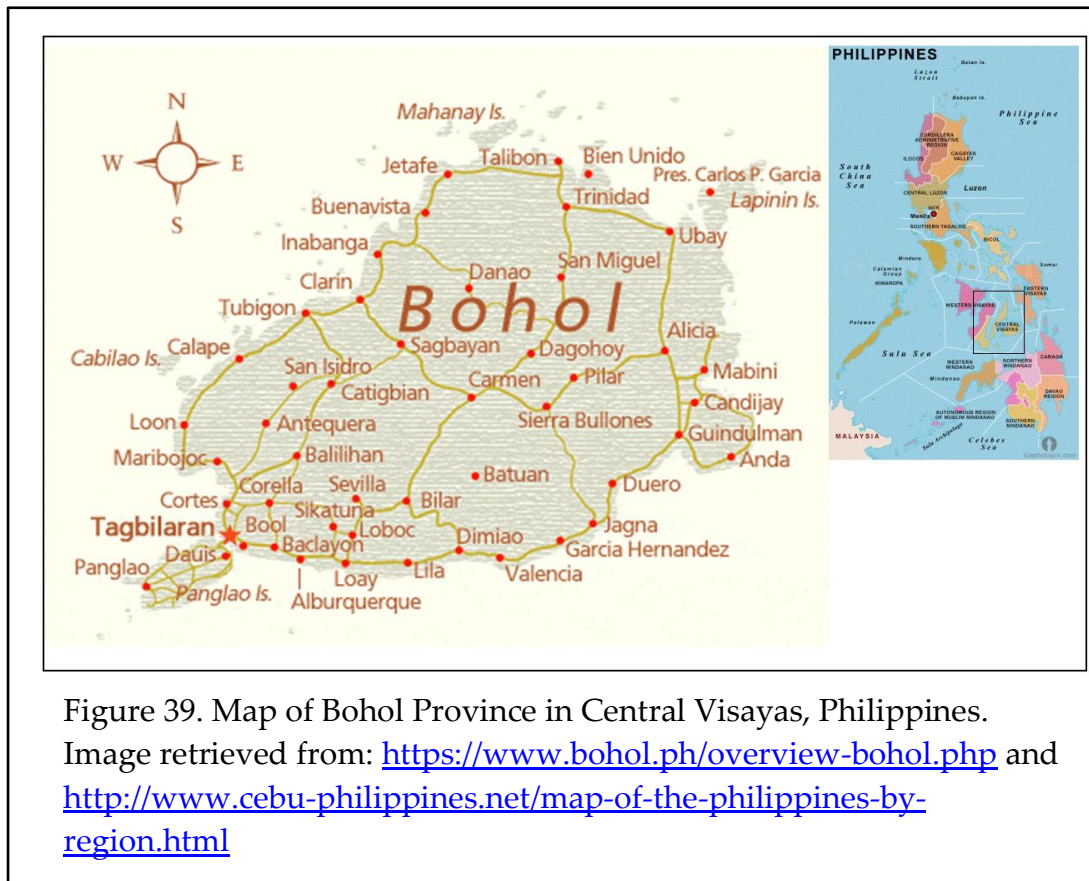
Cañiao is a cultural tradition among the Igorots that has been practiced for hundreds of years, and it has never been seen as a threat to one's health. But, with the emergence of new diseases and the re-emergence of some zoonotic infectious diseases, it is necessary that there is a need for greater awareness of animal-human-environment interactions in our everyday lives.

Case study 2: Barangay Livestock Aide (BALA) Program of Bohol

Research interest on Bohol's BALA Program. During my work with the FMD Project, I remember that the OPV of Bohol is one of the best performing local government units. They were consistently recognised for their initiatives, commitment, and diligence, especially in disease reporting and surveillance. The OPV Bohol was consistent in submitting FMD field monitoring reports and laboratory samples as one of their disease surveillance activities to maintain the Province's FMD-free status. I was also aware that their management and staff were competent and committed to providing services to the people. In fact the provincial government of Bohol has consistently been part of the distinguished list of 'Seal of Good Local Governance' awardees given by the Philippines' Department of the Interior and Local Government (DILG) (DILG, 2013; Serafica, 2014; DILG-Western Visayas, 2014), and in 2017 was regarded as a "hall of

famer” having received the award for three consecutive years since 2015 (The Freeman, 2017). As I had the opportunity to pursue research for my PhD, it stirred my interest to probe and determine how local governments, such as the Bohol OPV, manage their animal health and communication programs.

The Province of Bohol is the tenth largest island province in the Philippines (see Figure 39). It is located in the central part of the Visayas archipelago, about 700 kilometres south of Manila. In its northwest is Cebu Province, northeast is Leyte Province, southwest is Siquijor Province, and southeast is the island archipelago of Mindanao (Provincial Government of Bohol, Philippines Australia Human Resource Development Facility, and Orient Integrated Development Consultants Inc, n.d.). According to the available data from the Philippines’ National Statistics Office (2013), Bohol is composed of 47 municipalities and one city, Tagbilaran City, as its capital. It has 1,109 barangays or villages with an urban population of 275,128 and rural population of 864,002 (as of May 2012). Of the Province’s poultry and livestock population, the top five animals with the highest number (as of 2010) were: chickens (2,098,825); cattle (70, 896); goats (69,091); carabao or water buffaloes (63,595); and, ducks (29,146).



When I conducted my field work in Bohol from 20 October to 3 November 2008, I witnessed the unique ways in which linkages and dialogues between the communities and the Bohol OPV were done, such as in providing livelihoods through animal dispersal programs, and implementing the anti-rabies campaign in the communities. Likewise, I observed that one of the unique programs of OPV Bohol that of the Barangay Livestock Aide (BALA), was central to coordination of OPV Bohol's programs and dialogue in the communities.

The BALA Program mobilised community volunteers as extension workers to better provide OPV services in the villages. I found that the BALA Program was a good case of an institutionalised system that integrated the local setting and community values. In the succeeding sections of this thesis, I will describe the field data that I gathered through my observations, interviews, review of provincial government documents and visual documentation while I

accompanied staff of the OPV Bohol on their routine activities. I will particularly highlight the social and institutional characteristics of the BALA Program that guides the production of healthy poultry and livestock population in the communities.

Conception and objectives of BALA Program. Based on the OPV documents that were shared with me during my field work, the BALA Program was conceived in 1997 to address the growing demand for local resources to provide the poultry and livestock-related needs of the communities in Bohol. Barangay (or village) volunteers were trained and mobilised to provide a sustainable solution to the lack of technical manpower and geographical barriers to reach poultry and livestock industry players, especially those who were marginalised.

In 2000, three years after it was launched, the BALA Program earned a national distinction from the *Galing Pook* Foundation, an organisation that recognises innovative practices of local government units in the Philippines (<http://www.galingpook.org/>). There were then 517 volunteers that covered 20 municipalities (out of the 47 municipalities) in the BALA Program. Every decade since its formation, the numbers of BALA volunteers have doubled. In 2007 and 2016, there 1,176 and 2,264 volunteers respectively, operating in all the 47 municipalities (Provincial Government of Bohol, 2008; Tutas, 2016).

Mechanics and functions of BALA in the community. The OPV Bohol initially spearheaded the formation and coordination of the BALA volunteers that was later handed to the Municipal Agriculture Offices throughout the Province. A provincial legislation supported the formation and recruitment of BALA in the communities, specifically stipulated in Article 3, Section 131 of the Provincial Code of Ordinances (Provincial Government of Bohol, 2008). The OPV Bohol provided a basic training qualification, now required for BALA volunteers, while local officials in barangay communities managed each person. In assigning the BALA, the barangay official would ask about the potential BALA volunteer's

background with regard to their experience in raising animals and their knowledge of animal diseases. As one of the BALA volunteers recounted in an interview (Interview 08102206) where he had been endorsed by the barangay captain in his area:

...tinatanaong sa barangay captain yung kapasidad kung marunong mag-alaga ng hayop, tumingin kung may sakit ang hayop...galing sa provincial ordinance, si kapitan na ang nagpili kung sino ang dapat o bagay na ilagay (...the barangay captain asks if you have the capacity to take care of animals, know how to detect if an animal is sick... [in choosing the BALA volunteer] there is a provincial ordinance as the basis for the barangay captain to choose who is right or fit to be appointed...)

In my interviews with BALA volunteers there was a mix of new and old volunteers. From the 36 informants, seven informants were new volunteers (one year or less). Also, all the BALA informants had experience raising a variety of animals such as chickens, cattle, goats, or pigs (Field notes BO-8; Field notes BO-10; Field notes BO-19; Field notes BO-21; Field notes BO-29; Field notes BO-30; Field notes BO-31).

An expectation of BALA volunteers was that they attended regular training sessions organised by the OPV at least once a year for capacity building and regular disease updates. For a new appointed BALA volunteer, they were required to undergo a three-to-five-day training course that included hands-on field training. The municipal-level training and costs were shared: the barangay provided the transportation costs for their BALA, the municipal government provided meals and the venue for the training, and the provincial government provided speakers, training and information materials such as manuals, and the initial veterinary supplies (Provincial Government of Bohol, 2008). Following the discussion from a group interview (Interview 08102206), the BALA volunteers cited the tasks that they performed:

... *taun-taon may training, inaalang yung mga sakit ng hayop, yung physiology... sumasama sa mga vaccination, naglilista kung sino mga nag-aalaga ng hayop at kung ilan ang alaga... nagsu-survey sa basic needs assessment... (yearly, there is a training conducted, [in that training] we were informed about animal diseases, its physiology... we also join vaccination activities, make a list of names of animal owners [in the village], we note the kind and the number of animals that [each farmer or household] raise... we also assist in the conduct of basic needs assessment...)*

... *kami ang nagre-report sa kung anong kalseng sakit tapos yung mga treatment, antibiotics sila na... sa munisipyo na... nire-report namin sa MAO kung anong klaseng sakit, sila na nagtuturo sa amin kung paano ang gagawin (we report the kind of clinical signs or disease that we see and provide the initial treatment, [but for instance if further diagnosis or treatment is necessary] like antibiotics, it is the municipal official who takes charge... we report to the MAO [Municipal Agriculture Office] what kind of clinical sign or disease, then they teach us what to do for the animal treatment).*

I also gathered from the group interviews with the BALA volunteers that relaying field information and obtaining an immediate response, especially in distant areas, was not an issue. The BALA could easily send text message or call the MAO through their mobile phones (Interview 08102206). For reporting and monitoring, information flowed from the BALA volunteer to the Municipal Agriculture Office, then to the Provincial Veterinary Office. Every year a BALA convention was organised, in which the performance of the BALA was highlighted and narrated by one of the BALA informants (Interview 08102300):

... *reporting kami... galing sa barangay papunta dun sa munisipyo, i-receive nila yun, sila na bahala magreport nun [sa provet]. Through BALA convention makita natin na may mga performance ang mga BALA... (... we report... from the barangay it goes to the municipality, once the*

municipality receives it they are the ones who will report it to the provet [Provincial Veterinarian]. [how a BALA volunteer is performing in the field is known] through the BALA convention we can see the performance of the BALA).

In the other municipalities, the BALA adopted other tasks that included local policy-making and its implementation. For instance in the municipality of Dausi, the BALA informant (Interview 08102300) was also a barangay counsellor. In their barangay or village, he was assigned the chairpersonship of the agriculture committee.

Aside from capacity building, the BALA undertook organisational strengthening initiatives such as conducting regular meetings at both the municipal and provincial levels. These monthly meetings were opportunities for the BALA volunteers to raise concerns or issues (Field notes BO-28). Accident insurance cover, allotted from the provincial government's fund (charged to the Governor's Aid for rural workers) was provided for BALA volunteers (Provincial Government of Bohol, 2008).

The establishment of the BALA program contributed to improving the monitoring of animal diseases in the Province. The program also built a network that was useful at times of disease outbreak and response (Provincial Government of Bohol, 2007). The BALA was involved in implementing the *Bantay Rabies sa Barangay* (rabies monitoring in the villages) component of the Province's Bohol Rabies Prevention and Eradication Program (BRPEP), which was one of the prioritised animal health programs for the Province.

Over the years, the BALA Program has continued to grow and improve. The number of volunteers increased and it was institutionalised into an organised federation called the Bohol Association of Barangay Livestock Aide (BABALA) that was duly registered with the Philippines' Department of Labor and Employment (DOLE). From a government-supported program, the BALA has grown into a people's organisation through its collective establishment. It was an

initiative of the BALA members at the municipal level that led to their formation into a people's organisation. Figure 40 shows the functional chart of the BALA program in Bohol, which indicated the roles of the different local government units and the formed associations of BALA at the provincial and municipal levels (Provincial Government of Bohol, 2008) is illustrated.

Impact of BALA: community engagement, coordination with other institutions, and partnerships as a peoples' organisation. As discussed previously, the BALA was formed initially to establish linkages in the villages for monitoring and disease reporting of livestock and poultry populations. The organisation also became responsible for other provincial programs because of its good performance and strong community networks. This is one of the points that I will discuss in the following part of this thesis.

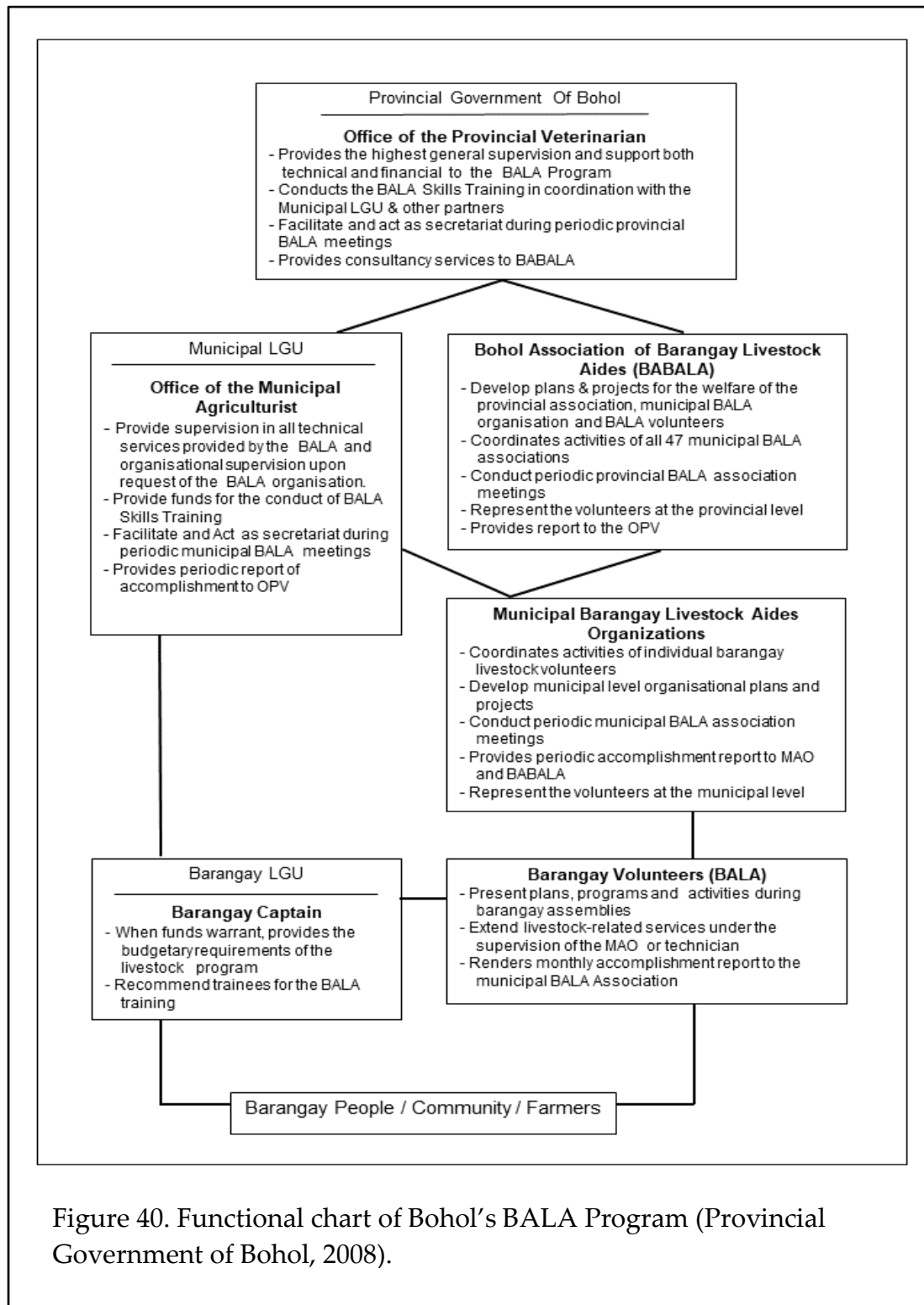


Figure 40. Functional chart of Bohol's BALA Program (Provincial Government of Bohol, 2008).

In my field data gathering, I observed the interaction of OPV Bohol management and staff with their stakeholders (including some selected BALA volunteers). From this, I ascertained the significance of the BALA in two services of the OPV Bohol: animal dispersal-livelihood programs; and, the implementation of the provincial anti-rabies campaign.

Involvement of BALA in animal dispersal-livelihood programs. The OPV Bohol implemented the Livestock Integration for Food and Family Enhancement (LIFFE) and Let's Help Bohol (LHB) programs. In implementing the animal dispersal system, the passing-on-gift (POG) was the symbolic and ceremonial turn-over of animals (the dispersed animals were known as Gift Animals) that was locally instituted. The POG adopted the 'pay-it-forward' principle as its main mantra. The provincial government and funding partners sourced and bought the original dispersed animals. These were carabaos, goats, pigs, chickens, and ducks that were awarded to the initial beneficiaries of the programs.

The initial recipients of the 'gift' animals later passed the offspring of the dispersed animals to another beneficiaries who then cared for the animals and passed on its offspring to another beneficiary, and so forth. In the POG ceremony, the actual passing of Gift Animals from the program co-operators and Animal Gift donor to the recipient-farmer was performed. The giving of the donor-card and reading of messages from the donor were highlighted in the ceremony. The POG ceremony was similar to a baptism ceremony as the Gift Animal was given its own names, which was usually the name of the donor to remind the recipient-farmer of their social obligation to pass on the gift that they too had received. The importance and role of the animals in their families was also emphasised at the ceremony (Provincial Government of Bohol, 2007). Figures 41 to 45 were the visual images I captured when I observed a POG ceremony (involving carabaos) on the morning of 21 October 2008 in the municipality of Clarin.



Figure 41. Preparing for the POG. Community members and staff from OPV Bohol prepare the animals and venue for the POG ceremony at Barangay Cabog in the municipality of Clarin.



Figure 42. The Animal Gifts to be handed to recipient-farmers in the POG ceremony.



Figure 43. Ceremonial POG. An official of the OPV Bohol reads the message on the donor card from the donor of the Animal Gift to the recipient-farmer.



Figure 44. Receiving the animal gift. One of the beneficiary families receiving the Animal Gift from its donor, surrounded by officials from the OPV Bohol, Municipal Agriculture Office and the BALA volunteer.



Figure 45. Response of the farmer. The recipient-farmer speaking, giving his response to the message of his Animal Gift donor.

The POG ceremony was practiced in the following two livelihood programs. The first, the Livestock Integration for Food and Family Enhancement (LIFFE) program was a sustainable development partnership among LGUs and NGOs, namely the Heifer International Philippines and different people's organisations (POs) in the municipalities. The aim of the program was to provide livelihood assistance for marginalised members of communities who were "classified as island villagers, river bank dwellers, displaced families, victims of submerged communities, women, and poor farmers and fisher folks" (Provincial Government of Bohol, 2007, p. 4). These were located in the areas of Bohol "with the highest poverty incidence, least government assistance, and insurgency problems" (Provincial Government of Bohol, 2007, p. 4). The main prerequisites for beneficiaries to receive the Gift Animals were: membership in a PO; and, participation in organisational and technical training, spearheaded by the program implementers in cooperation with local government agencies (like rural health units and local agriculture offices). Some of the usual training that was

conducted was: Value-based Planning; Farm Planning; Organic Gardening; Basic Health and Nutrition; Effective Management of Funds and Saving Scheme; and, Financial Management Training. In addition, the recipients of the Gift Animal were obliged to pay livestock insurance of PhP 700 (approximate range between AUD 15-20) per head to guarantee continuity of the dispersal system. Aside from animal dispersal, seedlings, fruit trees and garden tools were also distributed among family-beneficiaries who wanted to start their own gardens as a potential source of income. There were also financial loans given to support income generating start-ups for the POs such as for meat processing enterprises (Provincial Government of Bohol, 2007).

The LHB program was the second livelihood program that focused mainly on animal dispersal activities. This program was funded by the provincial government and overseas Boholanos associations. These included the Confederation of Boholanos, USA and Canada, and Inc-Bohol Association of Washington State (CONBUSAC-BOAWAS). The Heifer International Philippines partially supported the program. The LHB program had the same prerequisite as that of the LIFFE program of PO membership and participation in trainings to receive the Gift Animals. The only difference between the two programs was that beneficiaries of the LHB program were not obliged to pay any livestock insurance as this was continued from the original dispersed animal to its passed-on offspring (Provincial Government of Bohol, 2007). The POG ceremony that I observed in the municipality of Clarin was covered by the LHB program.

In the livelihood programs that were implemented, the active presence of BALA became a basic requirement for the selection of the area in which to invest the animal dispersal. This was critical, as the BALA volunteers would assist in the implementation of the program, especially in monitoring the condition of the Gift Animals.

Furthermore, as the number of BALA volunteers grew, some opted to collectively organise themselves into municipal associations. The members of the

BALA municipal associations had opportunities to not only serve their communities, but were also qualified to avail livelihood programs as a people's organisation. Being a recognised PO they too were able to take part in the livelihood programs and become recipients of Gift Animals, specifically from the LHB program. Other government funding sources, such as the Philippines' Department of Agriculture and Philippine Congress-District Representatives' Countrywide Development Fund, also provided support to BALA associations for animal dispersal-livelihood programs (Provincial Government of Bohol, 2008).

Participation of BALA in the Bohol Rabies Prevention and Eradication Program as main proponents of Bantay Rabies sa Barangay. The Bohol Rabies Prevention and Eradication Program (BRPEP) was managed by an inter-sectoral council headed by the Provincial Governor which included the local sectors of agriculture, public health, education, environment, legislation and local government (Lapiz, et al., 2012a; Lapiz, et al., 2012b). The aim of the BRPEP was to eradicate rabies by ensuring: zero incidence of human and canine rabies cases in the province; 80% of the households practicing Responsible Pet Ownership; reduce dog bite incidence by 70%; and zero stray dogs in the Province (Provincial Government of Bohol, 2007). When I did my field data gathering in 2008, these goals were set to be achieved by 2010. However, Bohol Province has since reported canine rabies cases between 2011 and 2015: There were three cases in 2011, one in 2012, six in 2013, three in 2014 and four in 2015 (OIE World Animal Health Information Database, 2018). There is still an ongoing threat of rabies in Bohol and reported cases but, the BRPEP was deemed successful as it facilitated increased disease surveillance, and a significant decrease in the number of human rabies deaths. Before this intervention, the Province had the fourth highest number of human deaths in the Visayas (Lapiz, et al., 2012a; Lapiz, et al., 2012b). Furthermore, one of the island municipalities in Bohol Province, the municipality of President Carlos P. Garcia, was recognised by the Philippines'

National Rabies Prevention and Control Program Committee as a rabies-free area in 2017 (Ligalig, 2017). Community involvement, dog population management, mass dog vaccination, dog-bite management, veterinary quarantine, diagnostics, surveillance and monitoring were the main components of the program. Funding and resources to implement the program were not only sourced from the government and partner NGOs, but dog owners (through their dog registration fees) also contributed to the program. It was also acknowledged that BALA, as community volunteers, played a crucial part in institutionalising the program. In fact, in the BRPEP organisational structure (Figure 46) the BALA was part of the Municipal Rabies Prevention and Eradication Councils as well as the *Bantay Rabies sa Barangay* (BRB) Councils (Lapiz, et al., 2012a; Lapiz, et al., 2012b).

On 22 October 2008, I observed the *Bantay Rabies sa Barangay* briefing orientation and paralegal seminar at the Municipal Office compound, in the municipality of Guindulman. It was attended by BALA volunteers and barangay officials who represented 19 barangays. The resource persons for the event were the Provincial Veterinarian and Legal Officer who described the BRPEP, policies pertaining to the anti-rabies campaign of the national government (i.e. the Anti-Rabies Act of 2007 and the Animal Welfare Act of 1999), and the goal of the province to eliminate rabies.

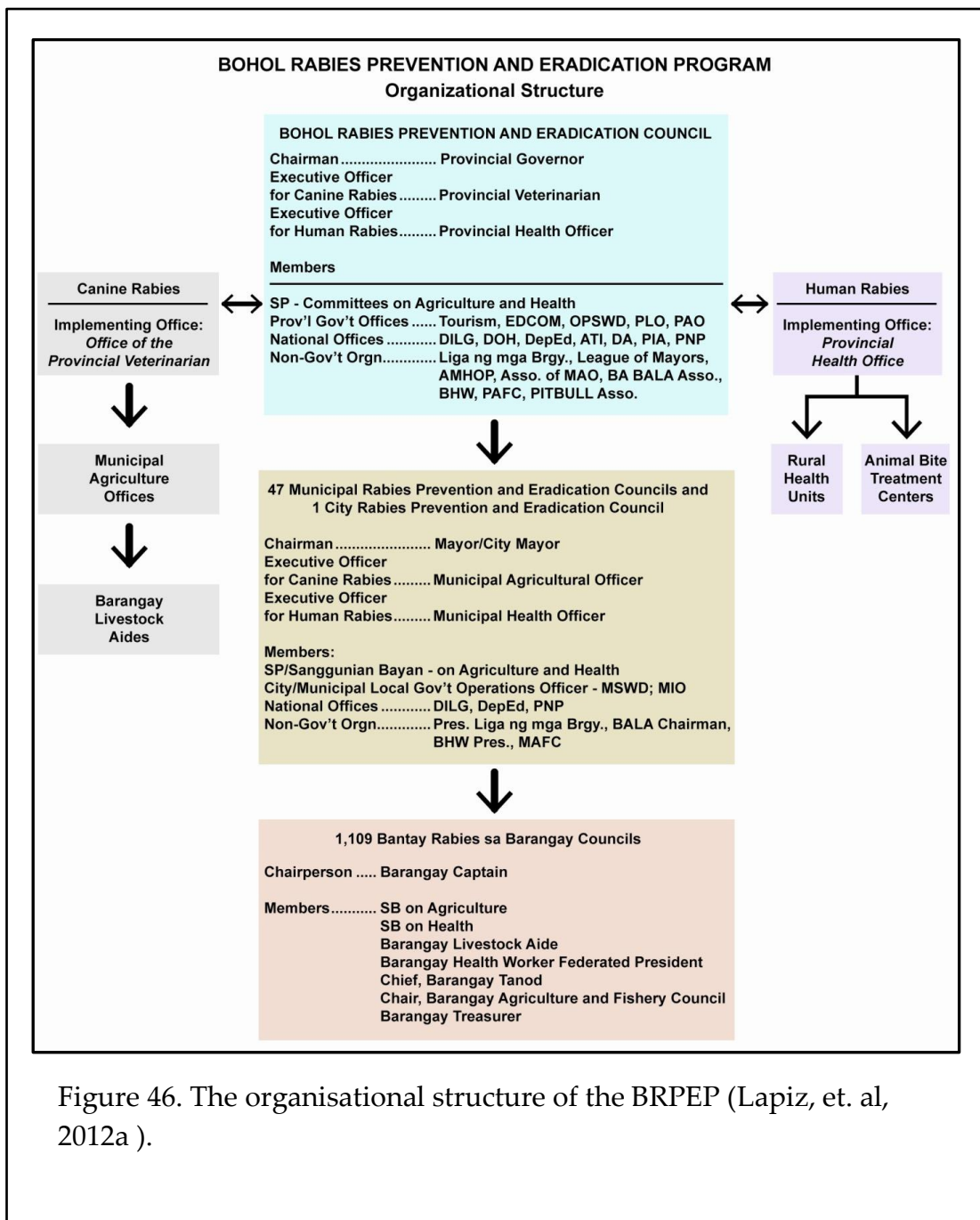


Figure 46. The organisational structure of the BRPEP (Lapiz, et. al, 2012a).

The importance and active implementation of the *Bantay Rabies sa Barangay* was emphasised. Part of the discussion with Dr. Stella Lapiz, the Provincial Veterinarian involved the critical role of BALA volunteers and others involved in the *Bantay Rabies sa Barangay* translation of technical information into simple language with a local context for the communities involved. Dr. Lapiz told stories she had experienced in the field that illustrated the importance of getting the right information and messages across to members of the community that would enable understanding of the disease and members to act on eradicating the disease. She asserted that dog-owners in the communities should register their dogs as part of responsible pet ownership, mandated by the law, and support regulations that would advance the BRPEP to control rabies in Bohol. She also talked about the production of the Rabies Handbook that would serve as information resource material for the BALA volunteers and BRB councils (Field notes BO-7). The BALA was actively involved in the implementation of BRPEP through the BRB in conducting a survey of the dog population and mass vaccination activities (Provincial Government of Bohol, 2007).

From the provincial government documents that I analysed and my field observations, the roles of the BALA were crucial to the effective implementation of the BRPEP. I argue that the past, current, and future participation of the BALA in the Province's anti-rabies campaign is crucial, especially now that the Philippine-government is committed to the global goal to eliminate rabies by 2030.

Assistance to other programs. The BALA volunteers attended awareness activities on Haemorrhagic Septicemia (*hagaw*), a disease that affects large ruminants such as cattle and carabaos. They assisted in vaccination and disease monitoring activities in the Province (Tapdasan & Salces, 2016).

The BALA volunteers were also involved in conducting provincial livestock profiling, where they served as enumerators during household livestock surveys. In addition, they were involved with a localised artificial

insemination (AI) program for cattle, carabaos and pigs, where they helped to survey animals in the community that were ready for breeding, organising heat synchronisation activities and monitoring inseminated animals (Provincial Government of Bohol, 2008).

Challenges in the program implementation and BALA volunteers' experiences. On 29 to 30 October 2008, I joined the OPV Bohol management and staff in their internal workshop activity. One of the inherent characteristics that I observed among the management of OPV Bohol was their sense of reflexivity in enhancing their operations to improve the implementation of their programs. The management leaders of OPV Bohol gather feedback from their staff and stakeholders. Suggestions that were given are considered in the decision-making process that enhances their strategies to achieve their office's program goals.

In the workshop that I observed, the OPV Bohol management and staff assessed the current programs that they were implementing. Their other agenda was the planning of the office's future activities using a logical framework approach, which was commonly used in project management. During the workshop sessions they evaluated each of their office's programs. Part of the discussion involved the problems they had encountered and identifying areas that needed improvement in their implementation of the programs. I observed their discussions and particularly noted their discussion about the BALA Program (Field notes BO-25).

On 31 October 2008, I observed the monthly meeting of the BALA Municipal Association Presidents of which about 27 BALA presidents attended. The OPV Bohol served as the secretariat, while the BALA chairperson, who was also the BABALA (provincial level association) president, presided over the meeting. The minutes of the previous meeting were read, then followed by a discussion about key concerns that arose from the previous meeting. The treasurer also presented a financial report of the association. Other concerns that were discussed in the meeting were: the schedule for the next year's BALA

Convention; the schedule for the BALA refresher training; and, concerns about the monthly submission of reports, for example, their accomplishment report and livestock monitoring reports (Field notes BO-26; Field notes BO-27; Field notes BO-28). I also conducted group interviews among the municipal BALA presidents after their official meeting.

During these two events, I explored the challenges encountered in the BALA Program implementation and the experiences of the BALA volunteers in performing their roles in the communities. Political intervention, lack of financial or logistical support, and inactive BALA volunteers were the main challenges, which I will detail in the next sub-sections.

Political intervention. Community representation in some barangays was one of the criticisms about the program as the BALA volunteer was chosen by the barangay captain and was left to their discretion (Field notes BO-28), for example, in some areas if a new barangay captain was elected, the current BALA volunteer could be replaced. This became a challenge when attempting to strengthen capacity and knowledge of the BALA. Thus the OPV Bohol had to conduct regular training and refresher seminars (Field notes BO-25).

Lack of financial or logistical support. The expectation of counterpart sharing of resources at the municipal and barangay levels was constantly reiterated by the OPV Bohol so as not to deplete the resources of the provincial government. However, some local government had financial limitations, and could not provide adequate support for their BALA volunteers. In order to address this concern, the BABALA endorsed a financial scheme where each BALA volunteer would pay PhP 60 (AUD 1.50- 1.75) as an annual membership fee (Field notes BO-28).

Another concern that was raised by a BALA volunteer was the frequency of the Municipal BALA volunteers' meetings. A BALA volunteer revealed that in their municipality only one meeting had been held since the beginning of the

year. The BALA informant shared the following with me at interview (Interview 08102300):

... ngayong taon na ito isang beses pa lang kami nagka-meeting. Barwat taon may apat na beses kami dapat na mag-meeting, pero ngayon isa pa lang. Hindi namin alam kung anong nangyari, anong problema ng MAO...pero kami, ang mga trabaho namin patuloy pa rin. Kapag may mga tao na nangangailangan sa amin pupunta pa rin kami doon (... this year we only had one meeting. Each year we were supposed to have four meetings, but as of now we only had one meeting. We don't know what happened. We don't know if the MAO [Municipal Agriculture Office] has a problem... but we continue with our work [as BALA volunteers]. If someone needs our help, we will go and help).

Inactive BALA volunteers. It was raised during the OPV Bohol's assessment of the BALA program that some of the volunteers were not actively performing their tasks in the communities. Some volunteers were not submitting their monthly reports and did not relay feedback to OPV Bohol on diseases monitored in their communities (Field notes BO-25).

Sustainable approaches of the BALA program. The challenges identified and discussed in the previous subsection illustrate that the program is a work in progress. However, what cannot be denied is that the BALA program made an impact in protecting the poultry and livestock industries of the Province (Provincial Government of Bohol, 2008). The BALA program enhanced livestock services delivered in the communities, particularly in: a) disease prevention activities, such as assistance in vaccination and deworming programs; b) disease surveillance and reporting—through monthly disease incidence reporting, submission of FMD negative monitoring reports, faecal sample collection, referral and disease reporting during emergency cases; c) information and education campaigns concerned with livestock production technologies as well as disease

prevention and control; d) livestock profiling; e) promotion of animal husbandry practices; and, f) involvement in the implementation and monitoring of other government and NGO programs in the Province (Lapiz, 2008).

The BALA program remains active. Policy, technical, and logistical support were provided continuously. Initiatives facilitated mentorship, sharing of experiences and best practices through the efforts of the OPV Bohol and partnership with other institutions. In 2016 the BALA Program was part of a 74-million livestock project in Bohol Province (Tutas, 2016).

Policy, technical, and logistical support. The support from the Provincial government through OPV Bohol was maintained. NGOs and local governments were strongly encouraged to contribute through cost sharing of resources and in-kind contributions. As discussed previously, there was a provincial ordinance that supported the formation of BALA. Some municipal mayors felt compelled to support the BALA program as they recognised the work force it involved throughout the province. The BALA was considered a legitimate group of volunteers that the local leaders, the municipal mayors and barangay captains, could harness in implementing development programs in the communities (Provincial Government of Bohol, 2008).

Mentoring community animal health workers in other local government areas. Through collaboration with Heifer International Philippines, the OPV Bohol had the opportunity to partner with other provincial governments in the Visayas and Mindanao. A mentorship training for community animal health workers was conducted, which was facilitated by OPV Bohol management and selected BALA volunteers. Animal health workers and community facilitators from the provinces of Surigao, Agusan Del Norte, Misamis Oriental, Negros and Leyte (Provincial Government of Bohol, 2007) participated in the training.

Sharing of experiences and best practices to be replicated by other local governments. The BALA Program has received regional and national recognition. It was inevitable that it would become an exemplar for agricultural extension

work and community mobilisation and the experiences and lessons learned have been shared in forums and academic conferences (Provincial Government of Bohol, 2008; Provincial Government of Bohol, 2007). From being a government-dependent program, the BALA continues to thrive as an independent people's organisation (Provincial Government of Bohol, 2008).T

My reflection and analysis of the BALA Program relevant to contextual understanding of health risks and biosecurity. As I discussed in Chapter 3 of this thesis, Asian societies tend to behave collectively. Hence, a sense of community and communality is inherent in this culture. As Filipinos we also have inherent traits of *pakikisangkot* (getting involved), *pakikisalamuha* (interacting with), *pakikilahok* (joining or participating with), and *pakikiisa* (being one with) rooted as communication concepts from *Sikolohiyang Pilipino* (Filipino Psychology). The concept of the BALA program was premised on these characteristics.

In my field research where I explored Bohol Province's BALA Program, I noted three important points that emerged from my observations. First, I found that community accountability and the formation of values were central to how the program was designed, implemented, and improved as the program expanded. Second, community awareness concerning disease prevention and control entailed sound governance that was based on the local communities' own concept of governance. Third, participation and community engagement could not be boxed into a set of guidelines. There needed to be continuous reflection on what was being experienced in the communities, and exchange of feedback among the different stakeholders. I will elaborate on these three points in the following subsections of this dissertation.

Community accountability and values formation. In the selection of BALA volunteers in the villages, merit was given to one's experience in animal-raising and basic awareness on animal diseases. A volunteer's basic knowledge was enhanced through training and meetings that they were required to attend.

They were aware of the exceptional responsibility of ensuring that they help keep the poultry and livestock population of the province healthy. BALA volunteers were serious about their tasks and recognised that they were accountable to the community members whom they served, and the barangay official who endorsed them and this was reflected in the field data that I gathered. Amidst the challenges or lack of support in some municipalities, BALA volunteers were not hindered by such difficulties, but viewed their role in the community as a social obligation to help the animal raiser in need.

As the BALA volunteers grew in number they realised the potential opportunities and organisational strength they may have as a people's organisation. Through the guidance of the OPV Bohol and their respective municipal and barangay government leaders they were given the support they needed to best perform their duties in their communities. As a people's organisation they had the opportunity to be recipients of livelihood programs in their Province. In the implementation of the livelihood programs, which the BALA volunteers were actively involved both as a recipient of the animal dispersal program and a community worker looking after the health of the animals, there was also regard for instilling values. The POG promoted camaraderie, the value of sharing, and taking responsibility for the animal that you received so you could pass it on to a family or household to help supplement their income.

Sound governance to support community awareness and actions on disease prevention and control. Determining the local institutional system that existed in the communities and reinforcing national policies on disease prevention and control served as a foundation for adopting appropriate communication approaches. This was reflected in the implementation of the Bohol Rabies Prevention and Elimination Program. As the BALA volunteers were already mobilised and had established links with the people in the villages, volunteers became actively involved in the community level implementation of

the anti-rabies campaign through the *Bantay Rabies sa Barangay*. They supported the rabies awareness and advocacy activities, including a mass vaccination campaign in their villages. They were also active in the other programs in their communities such as in FMD negative monitoring, an artificial insemination program, and in disease emergency situations.

The leadership and management competence of the OPV Bohol was also a significant aspect of sound governance as the BALA volunteers were supported continuously, and OPV Bohol consistently lobbied for their BALA volunteers' welfare among the national agencies, NGOs and local government executives.

Reflexivity and feedback exchanges in participation and community engagement. Aside from meetings, annual conventions, dialogues or consultations with the OPV Bohol, the BALA program's mentorship training as well as the sharing of experiences and best practices through different platforms were pragmatic approaches to engagement. These approaches permitted constant reflection on the appropriate actions that were taken and those that may need to be adjusted to address the challenges that were being faced.

It was apparent from the field data that the OPV Bohol initiated the BALA program to address the need for more human resource in delivering their animal health and production services Province-wide, but the volunteers and their communities eventually owned the program. They were empowered, and so the program continued to expand. The BALA progressed into a legitimate volunteer service program, and was recognised as a people's organisation. I found that the discourse should not focus on which approach was the best, 'a top-down' or 'bottom-up' approach, but should be on how communities could own the program and work on achieving its best potential by considering social and institutional contexts. The BALA Program case is an illustration of this as seen by how the BALA volunteers gained capacity for dealing with biosecurity threats and implementation of disease control programs.

Conclusion

During my field research, I saw the importance of cultural values and meanings attached to everyday human communicative actions. When I say communicative actions, I don't only pertain to the act of talking and listening, but more so in making sense of the things around us. Indigenous knowledge and traditional practices should be considered in relating to biosecurity concepts and measures. In the context of my ethnographic study in Benguet, I learned that there could be ways to maintain biosecurity measures and minimise health risks without compromising the rich cultural tradition of the local people. It is a matter of acknowledging their heritage, recognising their indigenous knowledge and practices, then working around evidence-based recommendations on health and biosecurity.

I also ascertained from this ethnography study that the notion of cleanliness (or uncleanliness) is a socio-cultural or socio-economic construct that needs to be determined. As this aspect was not covered in-depth in my study, I recommend this as a potential research topic. It will be worthwhile to interrogate the local people's notion and specific community's regard for sanitation and hygiene, which is crucial to their understanding of health risks. For instance, as basic as water accessibility is crucial to instigating communication about messages concerned with health risks. However, it will be interesting to know how the local communities regard water as part of hygiene if this community face challenges in accessing clean water.

Lastly, the case of Bohol's BALA program proved that 'collective' culture and local values may shape appropriate governance and institutional systems for disease prevention and control, which are relevant to the contextual understanding of health risks and biosecurity in communities. It could not be undermined that the Bohol's BALA program is a showcase of best practices on local collaboration and community engagement. The BALA program is a tangible

example of giving importance to local values in adopting a bottom-up, participatory communication, and community accountability approaches.

For communication to be effective there needs to be shared experiences among people of which can only be established through emergence of culture. I clearly highlighted in this chapter the need for probing on socio-cultural contexts particularly local practices on health risks and biosecurity management. Socio-cultural knowledge and practices are important elements in crafting an integrated communication approach. For communication to be effective there needs to be shared experiences of which can only be established through emergence of culture. towards achieving mutual understanding.

In the next chapter I discuss the case study of Singapore in addressing the SARS outbreak in 2003. I explored the institutional systems and communication approaches implemented during and after the SARS outbreak.

Chapter 6: Institutional Systems and Communication Approaches When Faced with an Unknown Disease: Battling SARS, the Singapore Way

Introduction

In a disease emergency situation or in maintaining the health of populations, which in this research pertains to human and animal populations as well as living organisms in the ecosystem, communication, both as a process and tool, plays a crucial role. Various communication approaches are means for knowledge acquisition and exchange, a process for involvement of multiple stakeholders, and a tool to institute ways for behavioural change. To achieve effective communication requires both technical knowledge and complementary policy frameworks. In managing disease outbreaks and keeping communities disease-free there have to be policy, guidelines, logistical support and standard operating procedures. Such instruments will aid the direction institutions and different stakeholders need to take to perform the tasks required of them. Cooperation among different key players such as the government, private enterprise, non-government organizations, stakeholder groups and local community members, are necessary. In a Southeast Asian context, it is potentially instructive to look into how Singapore addressed SARS (Severe Acute Respiratory Syndrome). Part of my research was to examine the country's institutional systems or arrangements as an interplay of the use of technical knowledge, policy frameworks and logistical capacity (which includes human and non-human resources) to manage disease emergency mitigation during the SARS outbreak in 2003. Institutional systems and policy support contribute to crafting an effective integrated communication strategy especially during biosecurity and health emergencies, as will be examined in this case of SARS in Singapore.

In this chapter, that is structured in three main sections, I report on the case study of Singapore's experiences in disease mitigation. In the first section I

describe the SARS cases in Singapore to provide a background to the disease emergency situation. I discuss the institutional and communication arrangements that existed in addressing emerging infectious diseases before, during, and after the SARS outbreak. In the second section, I detail the lessons learned from the SARS outbreak experience, preparedness for an influenza pandemic, and relevant measures to manage future emerging infectious disease situations. In the final section, I analyse communication principles drawn from the case study.

SARS cases in Singapore

Singapore's experience in mitigating SARS in 2003 is a good case study in managing an emerging infectious disease outbreak, especially during that period when there was no clear idea about the characteristics and epidemiology of the virus. Even some years after the SARS outbreak, it is still important to probe and articulate the experiences of those involved at that time of the disease crisis.

Country profile. In June 2003, the year when SARS was reported, Singapore's population was almost 4.2 million, by 2018 the population was estimated to be 5.6 million (Singapore Department of Statistics, 2004; 2018). Singapore is home to different ethnic groups, mainly Chinese (74.2%), as well as Malay (13.3%), and Indian (9.2%) (Marketline, 2017). A relatively small country in terms of population and geographical area (697 square kilometres), Singapore follows a parliamentary system that is led dominantly by the People's Action Party (PAP) (Datamonitor, 2004). Singapore's form of government is unique. Various descriptions have been given to it (Rahim, 2008) such as, an administrative state (Chan, 1975), a "hybrid regime described as a stable, semi-democracy" (Case 2002, as cited in Rodan, 2008, p. 232) and a guided democracy (Puri, 2003).

SARS crisis scenario. SARS was a previously unknown virus that originated in Guangdong Province in China in November 2002 and subsequently spread, extremely quickly to 37 countries around the world. During the SARS

outbreak in 2003, a total of 8,096 human cases were reported globally (WHO, 2018b), of which there were 774 human deaths. Countries such as China (including Hong Kong and Taiwan), Singapore and Canada reported the highest number of deaths. Three years after the outbreak, it was found that SARS was a zoonotic disease. In epidemiological studies, that the coronavirus which caused SARS, was found to originate from horseshoe bats living in caves in Yunan Province in China (Wang, et. al, 2006). The main intermediary host was found to be civets (sold in Chinese markets) who then passed the virus to humans.

The SARS outbreak resulted in isolation of patients from families, and uncertainty, even among medical experts of a then, unknown disease. The term Severe Acute Respiratory Syndrome was coined by WHO, two weeks (on March 15, 2003) after the first carrier of the virus in Singapore was identified. The virus first appeared in Singapore on March 1, 2003 in one of the largest hospitals in the country. The person carrying the SARS virus, had returned to Singapore after holidaying in Hong Kong (she been feeling unwell for a few days) and visited her paternal grandmother who was in hospital. The virus spread among the close relatives of the carrier, health workers in the hospitals, and sequentially to others who were in contact with relatives and health workers. Being a novel disease at that time, specialists across disciplines faced simultaneous tasks of: first, determining the appropriate treatment to cure the patients who contracted the virus; second, studying the aetiology of the SARS virus; and, third instigating ways to stop the spread of the virus.

The succeeding days posed a challenge in treating, tracing and containing the virus. The SARS outbreak in Singapore was declared a national crisis on April 6, 2003. Singaporeans controlled the spread of the disease through the cooperation of various stakeholders. The leadership of the Singapore government was a robust factor in quickly curbing the spread of the SARS virus. Almost three months later, on 30 May 2003, WHO cleared Singapore from the list of

SARS infected countries. After months of battling SARS, 238 cases and 33 human deaths were reported in the country (Chua, 2004; WHO, 2018b).

Responding to the SARS outbreak tested Singapore's capacity to minimise the negative impact on people's health and the country's economy. The SARS outbreak experience in 2003 also became an opportunity for Singapore to be innovative about disease mitigation, especially of an unknown disease. The experience also became a case in point to highlight lessons in responding to emerging infectious diseases.

In the following sections of this chapter, I will describe first-hand information that was gathered from one key informant interview and one group interview with middle management leaders of two major government offices of Singapore. These people were involved in addressing the disease emergency, and in facing the challenges of the SARS outbreak in 2003. The informants also shared their insights about effectively preventing the spread of a zoonotic emerging infectious disease, such as avian influenza, and preparing for a possible influenza pandemic. In addition to the interview transcripts, excerpts from the book authored by Mui Hoong Chua (2004) entitled *A Defining Moment: How Singapore Beat SARS* were used, mainly to complement the qualitative information that was gathered from the interviews.

Before the SARS outbreak. The 'September 11 Terrorist Attack' in the United States in 2001 prompted the Singapore government's interest in exploring its capacity to face similar acts of terrorism. So even before the onset of SARS, the government had set in place operational systems, specifically, an executive working group of permanent ministers that would lead the country in the case a national crisis. Similarly, the Singapore government recognized the importance of public information in crises and introduced the concept of resilience in their communication management.

A central executive group established to address national crisis. The Executive Group (EG)⁸ was formed in the 1980s as a central leadership group that was able to address security threats to Singapore, especially in a national crisis. The EG is chaired by the Secretary of the Ministry of Home Affairs and members are Secretaries of key ministries, such as the Ministry of Defence, Ministry of Health, Foreign Ministry, Ministry of Information, Communication and the Arts, among others. One of the key informants (Interview 08011700) explained the EG's origin:

It [EG] started out as an executive group for aircraft hijacks. We had incidents with the radar... the Islamic faction, and so on which talked about basically terrorism, security. And slowly as we got into the nineties and into two thousand, we ended up with something like SARS.

The EG meets or functions only when there is a crisis. However, if the scenario involves only a portion or small area of the country, a particular ministry that is mandated for certain task or concerns will address the situation. For example, if there are cases of Hand, Foot and Mouth Disease⁹ among children in one or two kindergarten schools, it is the Ministry of Health's primary task to manage or control the minor disease spread.

Aside from health and probable acts of terrorism, other crises such as fires and floods and other natural disasters such as typhoons, earthquakes and tsunamis are also under the responsibility of the EG. As soon as the scenario becomes a national crisis, the EG steps in. Resources and expertise from the different ministries are then pooled to address the emanating crisis, but because Singapore is a small country, most crises become a national crisis as articulated by the informant (Interview 08011700):

⁸ EG was later renamed as Homefront Crisis Executive Group (HCEG) after the SARS crisis (Chua, 2004).

⁹ "Hand, foot and mouth disease is a common human virus that usually affects infants and children younger than 5 years old. However, it can sometimes occur in adults. Symptoms of hand, foot and mouth disease include fever, mouth sores and a skin rash" (Centers for Disease Control and Prevention, 2018).

Unlike bigger countries, you know, we don't have suburbs, we don't have peri-urban. We are just one big city state. So we regard every crisis as critical, as national. We have a health epidemic in Singapore which is extremely serious because of the density of population. So we take it very seriously. This committee meets when a crisis happens.

Communication management included public understanding on resiliency.

The Ministry of Information, Communication and the Arts (MICA)¹⁰ is the lead ministry that deals with public awareness and communication campaigns at a national level. However, in most of the other ministries and statutory boards (e.g., the Agri-Food and Veterinary Authority or AVA), a corporate communications department was established that deals primarily with press relations. For other communication aspects, MICA provides technical and logistical support in public communications such as in developing communication materials and media releases. As the key informant (Interview 08011700) explained:

The corporate communications officers in the various ministries are actually my staff, MICA staff. So they are already there doing the work. So they liaise with us. They'll tell us what's happening. They seek our help from HQ [headquarters]. We provide whatever assistance in terms of manpower, finance, budgeting, IT, resources.

In times of disease emergencies or national crisis situations, the National Resilience Division (NRD) of MICA was tasked to support the communication arrangements of MICA. The NRD was established in mid-2002 as an offshoot of the 'September 11 Terrorist Attack'. There was a growing realization that the

¹⁰ In November 2012 MICA together with the Ministries of Community Development, Youth and Sports (MCYS) was restructured to three ministries, namely: Ministry of Culture, Community and Youth (MCCY); Ministry of Social and Family Development (MSF) and Ministry of Communications and Information (MIC). MICA was renamed as MIC which currently oversees "the development of the infocomm technology, media and design sectors, the national and public libraries, as well as Government's information and public communications policies" (AsiaOne, 2012).

peril posed by growing transnational terrorism and in implementing robust security measures, there was a need to reinforce the psychological resilience of Singaporeans (Menon, 2005).

During the height of the SARS outbreak. During the SARS outbreak the government not only focussed on equipping health and research facilities necessary to treating SARS patients and to studying the virus, but it paid equal attention to the 'entry and exit points' which impacted the country's economy and the interest of the public. Two main things were important to the government: public safety and the country's economy.

Singapore is a tourist and transport hub. In 2002, before the SARS outbreak, 5% (SGD 7.8 billion) of Singapore's GDP came from the Tourism sector (Asia-Pacific Economic Cooperation, 2004). Therefore, when SARS hit Singapore the following year, it significantly affected the tourism and transport-related sectors. Compared with data from the previous year (2002), visitor arrivals dropped by 30% in the last week of March 2003, and by 67% in April 2003. In 2002, the hotel occupancy rate was 74%, and a month before the SARS outbreak (February 2003) this rate was 75%. However, in April 2003, a month after the first SARS case was reported in Singapore, the hotel occupancy rate dropped significantly to 20%-30%. Some hotels reported a rate as low as 10% at the height of the SARS outbreak. Retail sales and revenue from restaurants, travel agents and taxis were also down by as much as 50% (Asia-Pacific Economic Cooperation, 2004; Lee & Warner, 2008).

The SARS outbreak also affected local trade and food supply. A vegetable wholesale centre was shut after confirmation that one of the wholesalers was feeling unwell and had contracted the virus (that person eventually died of SARS). The authorities attending to the wholesale centre were faced with the colossal task of immediately shutting down the centre and implementing contact tracing of more than 2,000 people. People implicated were not only Singaporeans, but also traders from Malaysia. Singapore's Minister for National Development

kept Malaysia's Agriculture Minister informed about the closure of the wholesale market. The Ministry of Health lead the quarantine procedures while police officers facilitated the closure of the Centre. The National Environment Agency (NEA) and the Agri-Food and Veterinary Authority (AVA) worked together to ensure that the centre was properly cleaned and disinfected (Chua, 2004). Because of the shutdown, a threat to food supply was plausible especially as Singapore relies mostly on sources outside of it for primary produce. As one of the informants (Interview 08011500) recalled the situation and the dilemma of a probable food supply disruption:

... unfortunately the disease first struck and was detected on somebody who handled vegetables at a centralized vegetable market and it's the Ministry of Health who handles quarantine and all contacts at that place ... it is a shut down so then if the place is shut down where else do we get the vegetables and where can we get the meat available to the public.

The detrimental impact of the SARS outbreak was so enormous and happening so fast that the government certainly had to initiate prompt and drastic action.

Top guidance from executive group. The spread of SARS occurred suddenly. Excellent guidance was necessary when the SARS outbreak was declared a national crisis. Menon (2006) narrated:

Within a month of the first infection, the Cabinet realised that SARS went beyond domestic public health issues and was not solely the responsibility of the MOH. The Prime Minister instructed the convening of the Executive Group (EG) or relevant Permanent Secretaries on 4 April, followed by a Ministerial Committee on 5 April, to oversee what was now a crisis of fear. Earlier, the PM had also set up a taskforce of three ministers under the Health Minister and the PM had made clear that one of its missions was "to think in terms of worst-case scenarios" and that it would have to ask many 'what if' questions (p. 364).

Ministerial committees were formed to undertake the necessary action to inform the various frontline agencies that instructed their staff about their urgent tasks. The ministries, statutory boards and grassroots organizations had to work together and frontline government staff complemented each other's capacity to manage the ongoing crisis. The inter-agency cooperation was straightforward in Singapore given the unique type of government the country had in place (see Rodan, 1993).

Prompt amendment of the Infectious Diseases Act. Policy support was imperative for the drastic enforcement of mitigation strategies in a disease emergency situation. Under a certificate of urgency, the Parliament approved the amendments to the Infectious Diseases Act on March 24, 2003. The amended Act reinforced stricter penalties for those who defied quarantine orders, especially when the Home Quarantine Order (HMO) was served among the households (Chua, 2004; Ooi, Lim, & Chew, 2005).

The quick revision of the legislation was critical to the management of the SARS crisis, as one of the informants (Interview 08011700) pointed out:

... we introduced the amendments to infectious legislative act within three days to allow the government to quarantine people, to allow us to put all kinds of electronic aids, bracelets and so on webcams, so the people stayed within their apartments ... if legislation doesn't back you, it's too late. We realized that in the amendment of the infectious act. We never anticipated SARS, it is not something that we were prepared for.

Policy came first. The government's primary aims were to ensure public safety, and avoid severe economic impact.

Various sectors received up-to-date information about SARS from one main source by different means. The government, being the main source of information, was transparent to the public and the international community. The MICA was the main ministry that facilitated public communication initiatives, which adopted various communication approaches, such as interpersonal

communication, the use of multimedia platforms (print, broadcast and internet-based), and communication campaigns. Those involved in communication management ensured that timely and correct information (Interview 08011700) were provided.

We use the whole spectrum of media. We don't contact just one sector. The audience is fragment[ed]. So we use the entire range available to us, [like for example] website. We have the SARS dot GOV which became a portal web, everything imaginable was written. Everything you wanted goes to the SARS website... it's hyperlink to Ministry of Health.

Use of various media platforms and communication approaches. Some of the distinct communication approaches used during the SARS outbreak were: a dedicated TV channel solely for SARS information to sustain awareness among the public (Menon, 2006; Chua, 2004); community mobilisation through the grassroots leaders and dialogue with the stakeholders (Chua, 2004); and an online campaign, 'www.singaporecanlah.com'. The aim of these were to reach out to the global audience to rebut misconceptions that Singapore was an unsafe place, and became a platform to re-build the country's image through stories, photographs, and live video footage of places in the country (Chua, 2004; Papineau, 2003).

In the case of AVA, it was important that good communication with their stakeholders was sustained, especially among the traders and consumers. When the wholesale vegetable market was closed, AVA staff had to inform the sellers, stall owners and buyers on what was happening, the quarantine protocols, and closure procedures. The AVA had to safeguard the consumers' interests, and not cause any panic that would disrupt the food supply. Even after the closure was lifted, AVA had to keep up a constant dialogue with the stakeholders. As one of the informants (Interview 08011500) recalled:

... so you got to talk to these people... about the damage, you know what to do after lifting to prevent the second incidence... so that's when the

serious period, when the place was down, we had to work it, relevant agencies were managing the place...

Media relations. Good media relations were also central to ensuring that information made public would not cause public fear or damage the government's credibility. The domestic media, mostly managed by the government, reported facts about the emerging virus and the measures being undertaken by the government. In addition, the media collectively took on the task to educate the public to help overcome the crisis. Gaining the media's trust and confidence was essential, as highlighted by the informant (Interview 08011700):

So we take them [media] into our confidence as fast as we can. We call them in exclusive briefings. We tell them the facts. We don't pretend about it. To give you an example, when the Ministry of Health has its briefings to the media, prior to that, the Director of the Medical Services meets with all the doctors from the SARS' hospitals for the daily meeting. And then the original data on the data list cases of SARS is laid on the table. And one person who's in the committee is the WHO representative, and this representative for this control for disease in Atlanta. They were allowed to sit down and look at the raw data. So we tell them, listen, there's nothing to hide. You have the access from the same raw data that we have before we go to the media. And that helped. Because they know that we're not hiding details from WHO. I think some countries were hiding data from WHO to avoid being penalized as SARS infected. We said no. Let them sit in with the draft committee. Let them sit with the director of medical services. Let them sit in with every daily briefing. So they have access to the same raw data.

Alongside transparency, coordination among the government and other interest groups was also crucial. In doing this, it allowed the government to be consistent

in the information and messages that came out in the media. For instance, the close coordination of the Health Promotion Board of the MOH with the MICA staff in developing collateral or information materials made its content credible and consistent with what was being implemented by the authorities. This consistency helped maintain the public's trust and encouraged communal action since the public was given reliable messages. As one of the informants (Interview 08011700) narrated:

We have the Health Promotion Board, which is part of the Ministry of Health that handles the propagation, promotion materials to television and radio, brochures and collaterals. So TV and radio, we used massive advantage. We brought in the Prime Minister to hold press conferences very early on, every two days I think. He will give the full works, local and foreign media. We used internet, new media as much as possible. But during SARS much less in 2003, new media was slowly taking shape. We have dialogues with the grass roots, ministers and MPs will go down and talk in gatherings in the grass roots. We had ministers, MPs and grassroots leaders going to flat-to-flat with brochures... what to do, what not to do, always wash your hands, don't touch, don't cough, wear the N95 mask... and we circulated one million thermometers, grass root leaders went house by house to give them free thermometers, every house. That was a massive task. So we used the full range traditional media, new media, face-to-face.

It is also important to note that part of the communication strategy implemented during the crisis was the motivation to make relevant information available through timely monitoring and evaluation of the approaches. The implementers were able to get feedback and adjust accordingly.

Our [NRD-MICA] philosophy was that you make it available. Whether or not people go in, you make it available. So any programs you missed will be repeated on SARS. Then we did polls every other day. Our officers will

conduct polls using survey companies. Polls of three hundred to five hundred [to] find out if the message is getting through... Do you understand what we're saying, are we talking nonsense? Where do you get your data? TV? Radio? Papers? Newspapers? How would you like to get your data information? Every two days? We found out for instance many older Singaporeans did not understand the messages because they were in Mandarin. Most older Singaporeans speak dialect. So we immediately change our television policy and allow dialects programming. We cater to them. So we have dialect programs. So the polls revealed lapses that we plotted in. (Interview 08011700)

Research was conducted on the information mentioned above, through public polls or survey, and was part of a routine strategy. Necessary adjustments were based on the results of the surveys to ensure that not only the key messages reached their intended audience, but that these were properly understood through use of the appropriate language.

Launched resource-sharing and multidisciplinary collaboration initiatives. There was a strong clamour to work together, as government leaders and key industry players were faced with the massive task of overcoming the crisis quickly. Complementing technical and managerial capacities helped Singapore to be SARS-free as soon as was possible. Government and private enterprises worked together, even on mundane tasks during the crisis. Various sectors, such as those involved in the tourism industry, the labour movement, grassroots leaders, coffee shop owners, hawker vendors and even ordinary Singaporeans contributed to the fight against SARS. Initiatives to boost the morale of the people, as well as promote messages of unity and hope where Singaporeans could rise above the challenges, were broadly set. One initiative, introduced by Singapore's Red Cross Chairman, was the 'Peach Ribbon Campaign' where donations were gathered for the Courage fund. The fund

supported the efforts of health workers and their needs during the SARS crisis (Chua, 2004).

Compensation for those who were affected by the SARS crisis was another concern. One case in point were the stall owners and vendors at the vegetable wholesaler market whose incomes were severely affected because of the market closure. Were they compensated? According to one of the informants (Interview 08011500) from the AVA there was no full monetary compensation to make up for the lost profit:

It was a massive situation and one of the issues also was compensation ... do you compensate all the produce ... in the end it was just a fraction, it was not really for compensation... it's just *ex gratia*¹¹, it was just a certain amount, something like that for the inconvenience ... it's a goodwill *ex gratia*, in other words no strings attached about that because your place was affected.

Another sector, the hotel owners and management, were not bothered about compensation, but instead rose to the challenge the country was facing. Without any hesitation, they provided rooms for health workers and hospital staff who were under quarantine. Although the rooms were paid for, the additional work for the hotel staff and risk of infection, without assurance of compensation, were not deterrents to supporting the government (Chua, 2004). Collective efforts, unity, and cooperation surfaced naturally as the country battled the disease crisis.

The multidisciplinary collaboration was evident at the height of the outbreak. Scientists, engineers and information technology experts from different research institutions and government agencies worked together to increase their knowledge of the SARS virus. They developed tests kits that generated rapid results, and produced equipment for monitoring fevers as well as database systems to track contacts and those who were under quarantine. This

¹¹ According to dictionary.com (2018), *ex gratia* means "as a favor rather than as a matter of right".

multidisciplinary collaboration and constant coordination with WHO allowed quick implementation of measures that enabled Singapore to be declared SARS-free by end of May 2003 (Chua, 2004).

Post-SARS lessons and new directions undertaken

Among Singaporeans, the SARS experience was a significant moment, which taught them valuable lessons. They recognized their shortcomings and transformed them into opportunities to improve their capacity to face a disease emergency (Chua, 2004). The lessons learned from the experience took them to another level of commitment and action in preparedness for emergencies.

Contingency and business continuity plans were created. Each ministry, statutory board and agency had to draft their own contingency and business continuity plans. The country responded to the urgency to innovate and sustain the country's capacity for emergency preparedness. Although general guidelines in international governing policies like the OIE and WHO were considered, the government of Singapore crafted its contingency plans based on the local, social, and economic contexts. The probability of an influenza pandemic was looming, due to changing global health situations. Singapore would want to be at the forefront in preventing the negative impact of disease emergencies, and they opted to be prepared for worst-case scenarios.

Since the SARS outbreak, medical establishments were improved and training among medical and health care staff was conducted to cope with situations such as a probable influenza pandemic (Cheng, 2003). Table top or simulation exercises were explored to evaluate the country's preparedness, for example, in an outbreak of avian influenza. In the past, the AVA instituted culling exercises in the case of poultry being infected with avian 'flu. Border control and social distancing were seen as strategies for use in a pandemic situation. Border control is crucial in contingency planning to avoid food supply disruptions. It was a straightforward strategy as there are minimal numbers of

entry and exit points in a small country like Singapore. With social distancing, it was necessary to maintain good broadband internet access nationwide so as not to disrupt critical business activities and people could still work from their homes. Students could continue their schooling and go on with learning, e.g., through TV programs. One of the informants (Interview 08011700) explained these contingency preparations:

They increase the numbers of infection quarantine wards in Tan Tock Seng [hospital], new kind of equipment they bought, control measures for hospitals like excess of patients, excess of visitors, all that has been rationalized so that we are ready for another pandemic. We've done exercises with all our clinics to make sure that they can cope with huge numbers of patients. So from the Ministry of Health's perspective great things have been done, on the medical side. On the communication side... you need to move very quickly, you need to mobilize people. We need to do constant table top exercises; don't take things for granted. We do a lot of exercises now for avian flu, social distancing. If we look at the previous pandemics, social distancing is important on how to keep, in the pandemic because they are told how do you manage it... we got to have broadband access, so the students can learn from home, how to do programming on television so they can watch television and learn when schools are closed; how to get people to work from home through telecommuting in a pandemic... so all these social distancing communication impacts. We've done lots of table top exercises. We've gone through stage by stage. We've done lots of exercises on border controls. Border control is much easier in Singapore... not very difficult.

Inter-ministerial and international collaboration were maintained. At the national level, different ministries continued to work together and shared available resources which increased the country's capacity to respond to emergencies. As one informant (Interview 08011700) highlighted:

SARS taught us a lot of things... one is that working across ministries. We took it for granted. They didn't realize how important it was. But in a national crisis you need to tap on everyone. So we tapped on the Ministry of Defence and they came up with this scanner, infrared scanner which is an innovation by Singapore... so working across ministries, across boundaries, tapping on each other's strengths and resources was actually crucial to the success of SARS.

The importance of international collaboration was recognized, especially as Singapore is geographically situated in a region where many novel viruses and diseases were emerging. It became relevant for Singapore to be abreast of new techniques and information on emerging viruses. The country strengthened its involvement in ASEAN and led the region towards public health safety and resource sharing.

... in fact we, in Singapore we initiated the set-up of this HPAI Task Force in the ASEAN... so we also got in OIE, ASEAN, and we have actually bilateral engagements with our ASEAN neighbours, bilateral with relevant agencies to exchange information on... (Interview 08011500)

Recognising the challenge to sustain public interest and consciousness on disease emergency preparedness. The first infectious disease outbreak communication workshop was held in Singapore in 2004. The country's experience was shared with other Southeast Asian countries including Indonesia, Thailand and Vietnam (WHO, 2005). After the SARS outbreak and the hype of the experience, the government anticipated the need to maintain the public interest. According to the informant (Interview 08011700):

The challenge will always be to maintain public alertness. You can educate them, you can give them the material, and you can do all the media blah, blah, blah but getting them to understand that this is the new world and that you cannot take these things for granted any longer, aren't easy. You can empower people with lots of information, but does it make them wiser.

Post SARS, the number of avian 'flu or HPAI cases reported increased in countries in Southeast Asia that had maintained Singapore's vigilance regarding an occurrence of another disease emergency or worst case scenario, an influenza pandemic. However, even with avian 'flu, people tended to be selective with information. They only received or retained information that suited them. It was not enough to have promotional and informational materials, as was affirmed by one of the informants (Interview 08011700):

Our big problem now is that people are losing interest in avian 'flu... You can only say so much, for a while they become nauseous. Be alert, so? Be vigilant, oh, what does that mean? Be vigilant to what? People are fed up, so now we are looking for new ways of getting the message across. We had an exhibition. ... [on] infectious disease. Just to get people to sit and think. We don't teach them very much but made them realize that this is not a game. This is serious business. And after the exhibition we had them mobile, they went all around Singapore. It's making rounds through the grass roots, through the outlands. Not too bad, there are lots of people going there. Hoping that the kids will go. We call them the invisible enemy. We decided to call it infectious disease in general.

The government continued to provide basic, if not general information to keep the public informed. Improvements to the ministries' organizational arrangements were also accommodated to address potential challenges of communicating to the public. According to one of the informants (Interview 08011700):

They [ministries] realized that if they don't get their communications package right... all hard work you do doesn't come to nought. 'Cause if the message doesn't get down to your audience you're wasting your time. So I think most ministries now have fairly sophisticated corporate communications outfits, every ministry now have. If you look at Singapore fifteen years ago, nobody have corp comms. It was a luxury that you could do without. In fact it used to be centralized in this ministry. What we have done now is we decentralized, every ministry has its own sophisticated corporate comms outfit. Every time we have a cabinet paper or discussion there is a paragraph that says on how do we handle the communicating it to the public. How do you do it? Radio? TV? Advertisements? New media? We are using all kinds of media technology. We can now upload it on YouTube. We are doing games on the websites to get younger ones interested on it. So communications has become a key component. It's a bit late but it is better now. Are they effective? Are there lapses? Yes. Are there holes in our policies? Yes. I think we just learned as we go along. We were very lucky under SARS because we could see what is happening around us, and we learned from that. It may not be that lucky next time. It may hit us before it hit others.

Communication has become an intrinsic part of the government's plan or strategy. It may not be about a particular disease, but as long as it stirs the interest and is a constant reminder to people to be prepared for any disease, this will suffice.

Communication principles from the Singapore SARS outbreak experience

The institutional system of Singapore may be characterised by regulated political and media control (Rodan, 2004). However, such institutional system could have contributed to the multi-sectoral collaboration and prompt

government actions that were undertaken during the height of the SARS outbreak that supported effective communication management.

Strong government leadership and policy support advances effective communication. As drawn from the Singapore case, the existence of an established executive group that provided excellent guidance in dealing with national security and emergency situations, and the prompt amendment of the Infectious Diseases Act were core foundations crucial to the shaping of effective communication approaches. Communication complements technical strategies and policy decisions in a disease emergency scenario as well as in addressing zoonotic emerging infectious diseases.

In response to the SARS crisis, the leaders of the Singapore government had set their goals early on, which ensured public safety, ceased rapidly the spread of the virus, minimised negative economic impacts, and fast-tracked recovery measures for the affected industries. The identification of specific audiences, key messages to convey (including the use of appropriate language), appropriate media or communication activities to implement, logistical support, and operational execution of a communication campaign must be part of holistic goals that work together with multi-agencies and sectoral counterparts.

Dissemination of information and communication management starts from the top-level. In a disease emergency or crisis situation the top-level of leadership needs to recognize that part of effective communication is transparency of information, both what you know and don't know. Such practice would facilitate good management of stakeholders' expectations, and prevent an attitude of massive fear of the unknown, especially zoonotic emerging infectious diseases. Also, part of information dissemination is involving the media in reporting correct scientific or technical information and policies.

Evidence-based approaches, such as the inclusion of research, as part of routine strategies, influence the choice of communication approaches.

Gathering feedback from the different stakeholders is important in crafting a

communications campaign as well as in implementing the activities. It is important that the right messages reach the appropriate audience, and that the messages being conveyed are understood. Conducting quick surveys, pre-testing of information materials, interviews and focus group discussions as evidence-based approaches should be inherent in routine communication undertakings.

The analysis of the SARS case experience in Singapore also brought to the surface issues to be considered when facilitating communication for understanding health risks and biosecurity.

Public understanding of health risks and biosecurity is necessary to sustain interest. One of the communication challenges that was recognised after the SARS crisis was sustaining the interest of the public, with regard to health risks and biosecurity concerns that became evident during the SARS outbreak. Public understanding of risk or even basic science has become more fundamental. Operationalising the concept of biosecurity that is relatable to everyday life could be done. For instance, border control and social distancing are strategies that can be related as everyday life examples of biosecurity. After the SARS crisis, Singaporeans and even others from Southeast Asian countries could easily relate to this as they had an awareness of, or for some, experience of similar disease emergency situations such as avian influenza and Ebola outbreaks.

Science literacy should also be heightened among various audiences that include children, elderly people, and media practitioners. Humanised stories that illustrate the concept of biosecurity in relation to health risks that are experienced in common life or daily settings should be told on easily accessible communication platforms. One that can be exemplified from the Singapore SARS case experience could be stories of the vegetable vendors from the central market that was closed down during the crisis, or stories of health workers who were tasked to do the contact tracing of suspected carriers of the virus. These kinds of

stories can be featured on multimedia platforms such as short film video stories or photo stories in the social media.

It was strongly illustrated in the Singapore SARS experience that communication is a necessity and not an afterthought. I extend this argument to the context of One Health and Ecohealth in addressing zoonoses.

Multi-sectoral and interdisciplinary collaboration should be established. As demonstrated in the Singapore case, different sectors, industry players, and specialists from varied disciplines cooperated and worked together to provide solutions to stop the spread of the virus as well as easing the negative impact of the SARS crisis. In my view SARS was a classic example of an interdisciplinary approach in action that has become a foundational premise in advancing the One Health concept.

Explicit agreements on resource sharing. Resource sharing includes human resources, technical capacities, logistical requirements, and available infrastructure. It is important that particular resources and which organizations could share are identified. Agreements and guidelines to such issues should be clearly discussed among the organizations and sectors involved.

Instituting communication and good relations among government leaders, policy or decision-makers, science experts or technical specialists, and media practitioners unique to the Singapore government. Part of recognising the value of communication is taking actual steps to ensure that communication becomes an inherent part of any multi-sectoral initiative. The potential of the communication discipline should be re-thought as equally important as the other disciplines.

Conclusion

In this case study, I have shown that institutional arrangements can influence the choice of communication approaches, and implementation of strategies to address zoonotic emerging infectious disease such as SARS. Even

before the onset of SARS in Singapore, institutional and communication arrangements existed: there was a central executive group mandated to lead the country in national crisis situations; and, the concept of resiliency was introduced for public understanding. Although these arrangements were initially passive, they contributed to swift actions by the government when the SARS situation turned into a crisis.

The government was faced with two crucial conditions: one, ensure public safety and quickly stop the spread of the virus, and; two, minimise negative impacts to the country's economy and fast-track recovery measures for the affected industries. These two conditions were central to how Singapore overcame the SARS crisis and moved forward to prepare for future emergencies. During the height of the SARS crisis, strong leadership was evident and was supported by legislation through the immediate amendment of the Infectious Diseases Act. Panic among the public was minimized because of effective communication arrangements and stakeholder engagement. The SARS crisis was overcome very efficiently through the dissemination of up-to-date information, multidisciplinary collaboration and cooperation among the various sectors. After the SARS experience the government was prompted to draft contingency and business continuity plans. International collaboration and inter-ministerial cooperation were maintained. The government even recognised potential challenges such as sustaining public alertness and interest in disease emergency preparedness.

That a country's unique institutional system can influence the communication approaches deemed necessary in a disease emergency scenario to ensure the quickest response possible has been demonstrated by the Singapore example. Whether a top-down or bottom-up approach is used, what is crucial is to use that which is best suited at the time, and socio-culturally appropriate.

The lessons and ideas drawn from this case study contribute not only to approaches and strategies in disease preparedness, response and prevention, but

also in the applications of inter- and transdisciplinary approaches. As collaboration of specialists in animal and human health, wildlife and ecology emerged on a global scale at the height of the SARS outbreaks, I argue that learning from the SARS experience remains relevant to One Health (OH) and Ecohealth (EH). In the next chapter, I report the results of the systematic literature review on communication in OH and EH in addressing zoonotic diseases. I will discuss the trend of communication-related literature between 2004 (post-SARS) and 2018, and the emerging communication discourse.

Chapter 7: Investigating Communication in One Health and Ecohealth

Introduction

In Chapter 5, I reported my findings on the socio-cultural and institutional contexts in understanding health risks and biosecurity. I also I argued the significance of determining the local contexts and values in communication to address infectious diseases. In the previous chapter, I explored Singapore's experience in addressing the SARS outbreak in 2003. The unique institutional characteristics of the country, which admittedly include regulated political and media control, allowed multi-sectoral and collaborative mechanisms, supported by effective communication management, to promptly address the disease emergency. In the discussions in those chapters, I showed that even more than a decade ago, collaboration and interdisciplinary approaches were relevant in addressing health risks, biosecurity and infectious diseases. These events, I believe contributed to the development of the One Health (OH) approach that were also prompted by the global impacts of zoonotic disease outbreak events such as SARS and avian influenza (Davis, 2011; Zinstagg, Schelling, Waltner-Toews, and Tanner, 2011; Zinstagg, et al., 2012). In Chapter 2, I discussed OH and Ecohealth (EH) in the context of zoonosis and that inter- and transdisciplinarity were fundamental to these approaches.

Cadiz (2018) emphasized the need for development communication scholars and practitioners to engage with other disciplines in multi-, inter-, transdisciplinary ways, particularly in OH and EH collaborations, in providing solutions for development issues. I agree with Cadiz (2018) that development communication is a dynamic discipline with the potential to contribute solutions to complex problems such as zoonotic infectious diseases.

One of the end-goals of communication is to achieve mutual understanding. But how do we achieve mutual understanding? One way is through consensus-building. However, in OH and EH collaborations which

addresses complex problems by collaborators of varied backgrounds how can consensus be achieved through communication?

An initial step is to interrogate the role of communication in OH and EH settings through an assessment of the current literature, hence the rationale for the systematic literature review. The main aim of the review is to determine the current communication landscape in OH and EH to complement my field research findings, and support the integrated communication framework that is proposed in my thesis.

In this chapter, I will discuss the findings from the systematic literature review on communication in relation to OH and EH approaches. This chapter has three sections: a general description of the articles eligible for assessment; an analysis of the communication aspects; and an inference on the emergent communication discourse in One Health and Ecohealth approaches.

I deem that the systematic literature review has crucial contribution in shaping the integrated communication framework. The emergent communication discourse drawn from the analysed literatures, together with the insights from the cases studies in the previous chapters, supported the identification of necessary elements for an effective communication strategy.

Description of the assessed articles

Types of articles, year of publication and geographical focus. The detailed methodology for the systematic literature review is described in Chapter 4. I screened 939 literature records from the Web of Science and Scopus databases as well as from the online resources of OIE and FAO AGRIS websites. I read the abstract of each literature record and discarded irrelevant articles based on the inclusion and exclusion criteria described in Chapter 4. Out of the 939 records, 78 records were shortlisted and re-assessed for their relevance that explicitly focused on communication in the OH or EH approaches. I found that in

numerous articles authors mentioned the term communication or recognised communication in OH, but only in a superficial manner. After scrutinising each literature record, 14 articles were eligible for the assessment (see Table 8 for the list of the articles).

The types of articles were mostly research reports (six articles), closely followed by reviews (five articles), and the remaining three were editorial or opinion articles. There was at least one publication each year between 2010 and 2018. Three of the 14 articles were published in 2018, suggesting that communication is of increasing importance in the field. In terms of the geographical focus, in half of the articles, case examples were cited or the study was conducted in countries in North America, particularly in the United States. Three articles have a global perspective (Alders, et al., 2014; Cipolla, et al., 2015; Mekaru & Brownstein, 2014), and only one article cited examples from countries in Southeast Asia, specifically in Indonesia and Vietnam (Alders, et al., 2014). In the remaining articles, case examples were cited or the studies were conducted in countries such as Australia, Italy, Tanzania and Zambia.

These initial findings indicate that even though the importance of communication in the OH and EH approaches is now recognised, there are few reports that focus specifically on the nexus of communication, one health and infectious diseases. Communication programs and efforts applied in Asian contexts, which is my main geographical interest are under-reported, given that the lowest number of publications meeting the search criteria were in this region, and not a single paper on communication research in relation to OH was found. The underrepresentation of Asia in the literature could also be a language limitation as I only included literature available in the English language.

Table 8

List of articles assessed for the systematic literature review

Type of article	Author/s	Year of publication	Title of literature	Name of journal and other details	Geographical focus
Editorial/opinion	Adams, Michael J.; Harris, Reid N.; Grant, Evan H.C.; Gray, Matthew J.; Hopkins, M. Camille; Iverson, Samuel A.; Likens, Robert; Mandica, Mark; Olson, Deanna H.; Shepack, Alex; Waddle, Hardin	2018	Prepublication Communication of Research Results	Ecohealth Volume 15, Issue 3 pp. 478-481	North America (US and Canada)
Review	Alders, Robyn; Awuni, Joseph Adongo; Bagnol, Brigitte; Farrel, Penny; de Haan, Nicolene	2014	Impact of Avian Influenza on Village Poultry Production Globally	Ecohealth Volume 11, Issue 1 pp. 63-72	Global with case examples in Indonesia, Nigeria, and Vietnam

(continued)

Table 8

List of articles assessed for the systematic literature review (continued)

Type of article	Author/s	Year of publication	Title of literature	Name of journal and other details	Geographical focus
Editorial/opinion	Bagnol, Brigitte; Clarke, Elizabeth; Li, Mu; Maulaga, Wende; Lumbwe, Hilda; McConchie, Robyn; de Bruyn, Julia; Alders, Robyn Gwen	2016	Transdisciplinary Project Communication and Knowledge Sharing in Tanzania and Zambia through a One Health Lens	Frontiers in Public Health Volume 4 Article 10	Sub-Saharan Africa in Tanzania and Zambia
Review	Cipolla, Micaela; Bonizzi, Luigi; Zecconi, Alfonso	2015	From "One Health" to "One Communication": The Contribution of Communication in Veterinary Medicine to Public Health	Veterinary Sciences Volume 2, Issue 3 pp. 135-149	Global, Europe/Italy as case example
Research report	Crockford, C.N.; Dean, A.J.; Reid, S.; Dean, J.H.	2018	Conservation Values and Risk of Handling Bats: Implications for One Health Communication	Ecohealth Volume 15, Issue 3 pp. 682-687	Australia (Cairns)

(continued)

Table 8

List of articles assessed for the systematic literature review (continued)

Type of article	Author/s	Year of publication	Title of literature	Name of journal and other details	Geographical focus
Review	Decker, Daniel J.; Evensen, Darrick T.N.; Siemer, William F.; Leong, Kirsten M.; Riley, Shawn J.; Wild, Margaret A.; Castle, Kevin T.; Higgins, Charles L.	2010	Understanding Risk Perception to Enhance Communication about Human-Wildlife Interactions and the Impacts of Zoonotic Disease	ILAR Journal Volume 51, Issue 3 pp. 255-261	US
Editorial/opinion	Decker, Daniel J.; Siemer, William F.; Wild, Margaret A.; Castle, Kevin T.; Wong, David; Leong, Kirsten M.; Evensen, Darrick T.N.	2011	Communicating about zoonotic disease: Strategic considerations for wildlife professionals	Wildlife Society Bulletin Volume 35, Issue 2 pp. 112-119	US with case examples on: Wisconsin Department of Natural Resources' response to CWD in white-tailed deer (<i>Odocoileus virginianus</i>) in 2002

(continued)

Table 8

List of articles assessed for the systematic literature review (continued)

Type of article	Author/s	Year of publication	Title of literature	Name of journal and other details	Geographical focus
Review	Decker, Daniel J.; Siemer, William F.; Evensen, Darrick T.N.; Stedman, Richard C.; McComas, Katherine A.; Wild, Margaret A.; Castle, Kevin T.; Leong, Kirsten M.	2012	Public perceptions of wildlife-associated disease: Risk communication matters	Human-Wildlife Interactions Volume 6, Issue 1 pp. 112-122	US
Research report	Hanisch-Kirkbride, Shauna L.; Riley, Shawn J.; Gore, Meredith L.	2013	Wildlife Disease and risk perception	Journal of Wildlife Diseases Volume 49, Issue 4 pp. 841-849	US
Research report	Hilton, Shona; Hunt, Kate	2011	UK newspapers' representations of the 2009-10 outbreak of swine flu: one health scare not over-hyped by the media?	Journal of Epidemiology and Community Health Volume 65, Issue 10 pp. 941-946	UK

(continued)

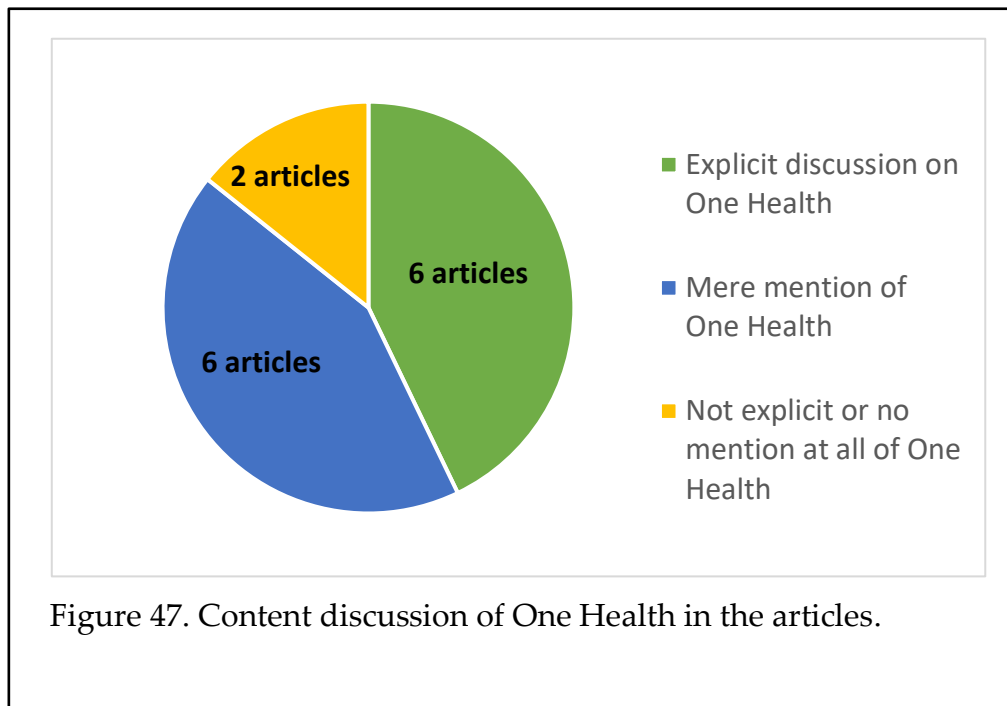
Table 8

List of articles assessed for the systematic literature review (continued)

Type of article	Author/s	Year of publication	Title of literature	Name of journal and other details	Geographical focus
Research report	Jemison, Micaela	2017	Communication considerations for one health: the influence of media framing on representations of a human-bat disease conflict in the Australia print media	Australian Zoologist Volume 38, Issue 4 pp. 505-517	Australia (Queensland and New South Wales)
Research report	Lu, Hang; McComas, Katherine A.; Buttke, Danielle E.; Roh, Sungjong; Wild, Margaret A.; Decker, Daniel J.	2017	One Health messaging about bats and rabies: How framing of risks, benefits and attributions can support public health and wildlife conservation goals	Wildlife Research Volume 44, Issue 3 pp. 200-206	US
Review	Mekaru, S. R.; Brownstein, J. S.	2014	One Health in social networks and social media	OIE Revue Scientifique et Technique Volume 33, Issue 2 pp. 629-637	Global
Research report	Roh, Sungjong; Rickard, Laura N.; McComas, Katherine A.; Decker, Daniel J.	2018	Public understanding of One Health messages: The role of temporal framing	Public Understanding of Science Volume 27, Issue 2 pp. 185-196	US

One Health themes of articles and communication discipline

involvement of authors. In reading the full-text of the 14 journal articles. I identified content on OH or EH concepts. , see Figure 47.



In six articles, OH was explicitly discussed, which defined the concept and described the interdisciplinarity of the approach. In another six articles, OH was merely mentioned. Rather than fully engaged with, the OH approach was usually referred to only in the title of the article, in the introduction, or concluding parts. All 12 articles used the term 'One Health' in their discussion, and not 'Ecohealth', although in my literature search I used the two terms as keywords. In two articles, the 'One Health' concept was not explicitly used or not mentioned at all, but infectious diseases were discussed in the articles. One article was about avian influenza, another, *Batrachochytrium salamandrivorans*¹² (B.sal) I construe from these findings that

¹² Bsal is an emerging global pandemic threat to amphibians and biodiversity, specifically in Northern America (Adams, et al., 2018) and Europe (Bsal Europe, 2019), which are assumed

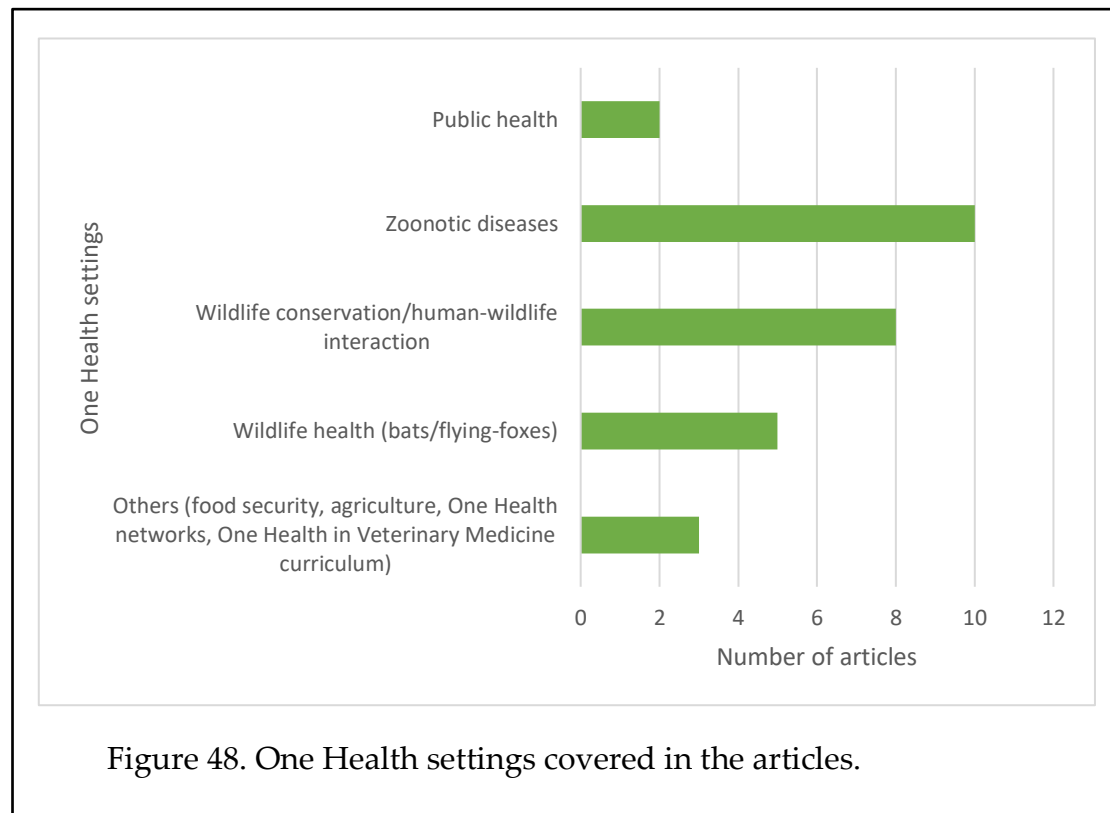
in the last ten years (2010–2018) there has been a growing familiarity with the concept of OH among the academic audience. The finding also indicate an increasing research interest in OH, and exploration of the application of an interdisciplinary approach.

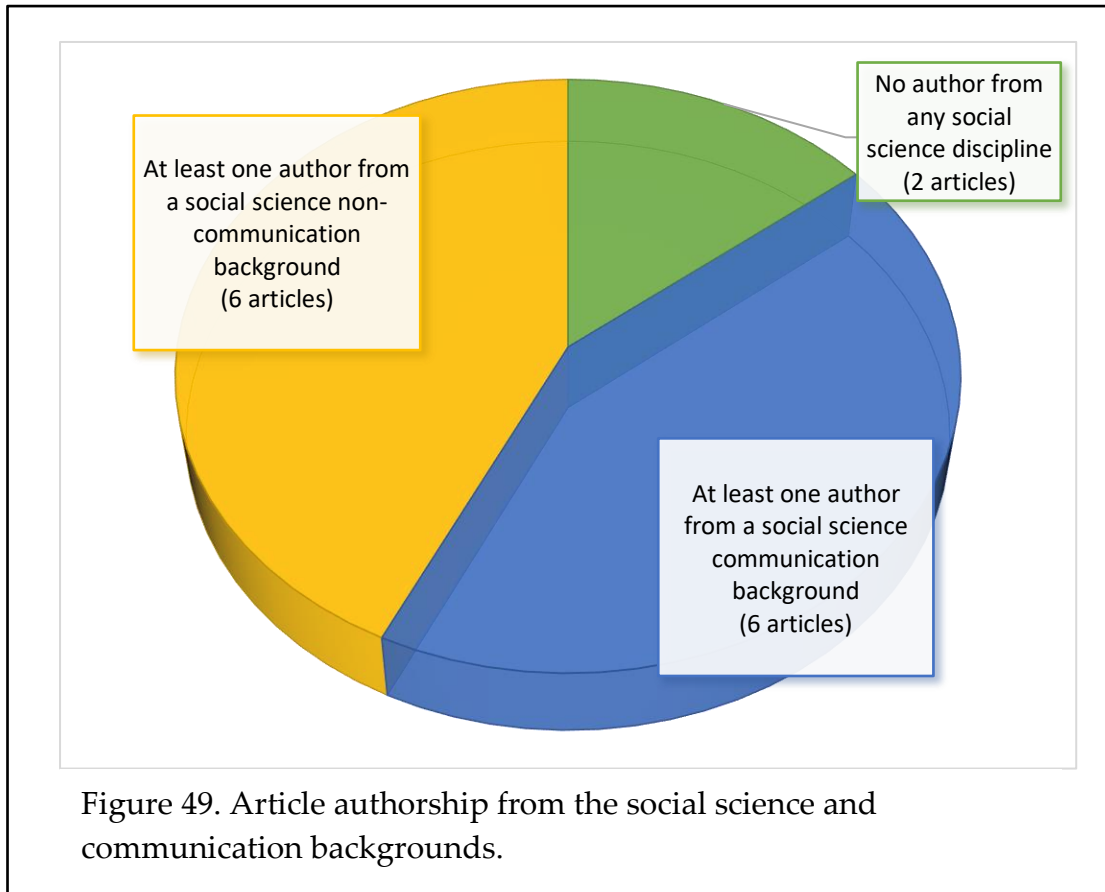
As OH is a holistic approach that inter-relates human, animal, and environmental health, I determined the usual OH setting where the communication aspects were explored, see Figure 48. In most of the articles (10 articles), communication and OH approaches in zoonotic diseases (Adams, et al., 2018; Alders, et al., 2014; Crockford, et al., 2018; Decker, et al., 2010; Decker, et al., 2011; Decker, at al., 2012; Hanisch-Kirkbride, et al., 2013; Jemison, 2017; Hilton & Hunt, 2011; Lu, et al., 2017) were explored. Among these articles, three articles focused on specific zoonotic diseases such as avian influenza (Alders, et al., 2014), swine ‘flu (Hilton & Hunt, 2011), and Hendra (Jemison, 2017). In other articles, other zoonotic diseases such as rabies, West Nile virus, Lyme disease, chronic wasting disease, and plague (Hanisch-Kirkbride, et al., 2013; Lu, et al., 2017; Roh et al., 2018) were mentioned. In eight articles, wildlife conservation or human-wildlife interaction (Adams, et al., 2018; Crockford, et al., 2018; Decker, et al., 2010; Decker, et al., 2011; Decker, at al., 2012; Hanisch-Kirkbride, et al., 2013; Jemison, 2017; Lu, et al., 2017) were analysed. I noted that each article may have had more than one setting where communication was explored.

Another inherent characteristic of OH is its interdisciplinarity. As I am particularly interested in the communication aspect, I examined the affiliation of each author. In articles where the affiliation of the authors were not indicated, I searched the author’s name in Google and was lead to their profile in the institution to which they were connected or on their LinkedIn

to be a One Health concern because there is a need for communication and interdisciplinary approaches.

professional network page where I found information on their affiliation. I determined the number of articles that had at least one author from a social science background, and noted from those articles, whether at least one author was from a communication background, see Figure 49.





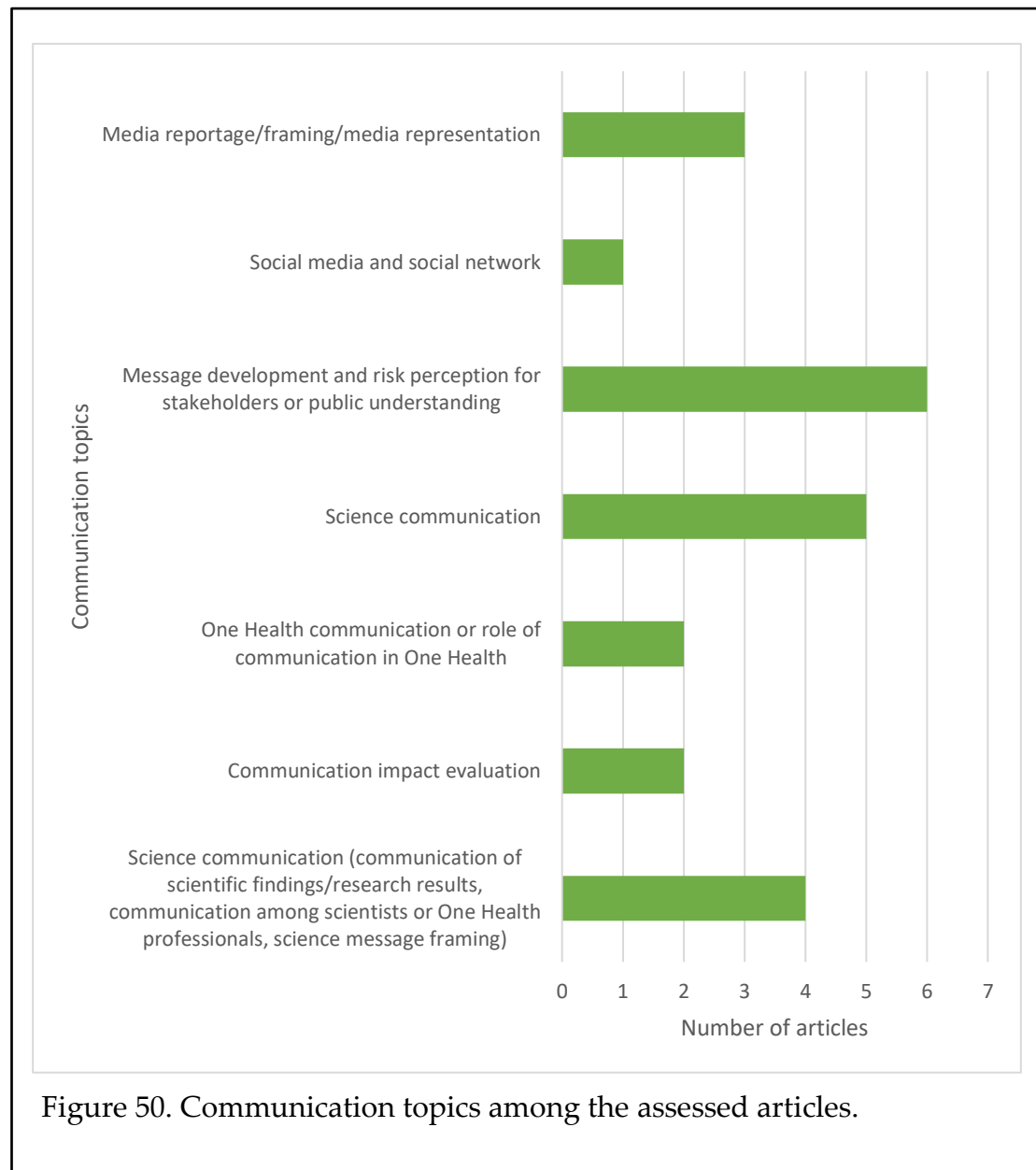
Twelve articles had at least one author who was from a social science background, such as anthropology and sociology. From those articles, half had at least one author from a communication background. In a series of articles published by Decker, et al. (2010, 2011 and 2012), I noted that in their first publication in 2010, there was no author with a communication background although the authors spanned different disciplines investigating wildlife health and human-wildlife interaction. However, later in their published work from 2012, one author had a social science and communication background.

From the above findings, communication in OH was used to mainly address zoonotic diseases and concerns in wildlife conservation or human-wildlife interaction. Social science perspectives in OH collaboration were included in many of the articles. However, particular involvement from the

communication discipline could be improved. In the next section, I will discuss my detailed findings in analysing the communication aspects covered in the retrieved literature.

Analysis of communication aspects in One Health

Communication topics and research methodologies. Upon reading the articles, I recorded the communication topics that were explored. There were some articles that dealt with more than one topic that I also noted as seen in Figure 50. In six articles, the focus of the discussion was on message development for stakeholder and public understanding (Crockford, et al., 2018; Decker, et al., 2010; Decker, et al., 2011; Decker, at al., 2012; Hanisch-Kirkbride, et al., 2013; Lu, et al., 2017), followed by topics on science communication. I further differentiated science communication into: communication of scientific findings or research results (Adams, et al., 2018); communication among scientists or OH professionals (Cipolla, et al., 2015; Decker, et al., 2011; Mekaru & Brownstein, 2014); and message framing in science communication (Roh, et al., 2018).



In the previous section, I stated that six articles were research reports and I identified the communication research methodologies employed in those studies. These were survey (Crockford, et al., 2014; Hanisch-Kirkbride, et al., 2013), experiment (Lu, et al., 2017; Roh, et al., 2018), and content analysis (Jemison, 2017; Hilton & Hunt, 2011, which are quantitative approaches. Also, from those research report articles, studies on print media framing of risk messages on zoonotic infectious diseases, such as the case of

Australia's Hendra virus outbreak in 2011 (Jemison, 2017) and UK's swine flu outbreak in 2009-10 (Hilton & Hunt, 2011) were reported in two articles. In one article, wildlife disease risk-messages framing science communication (Roh, et al., 2018) was analysed. Reinforcing Entman's (1993, cited in Lu, et al., 2017) contribution, 'to frame' is to select specific information and make it more relevant in a way that supports a "specific problem definition, causal interpretation, moral evaluation, and/or treatment recommendations" (p.52).

It was apparent from the findings mentioned above that the dominant communication topic in OH is about message development, which I assert is interrelated with science communication and risk communication of wildlife and zoonotic diseases. Media framing, which was also reflected in the articles I analysed, could also be attributed as a significant concern in science communication and risk communication. In terms of communication research methodology, I found that quantitative approaches were used in several studies.

Communication arguments posited in the literature. In all articles it was argued that effective communication is necessary in the various settings of the OH approach. Communication is viewed as an important part of OH collaboration and research, confirming Bagnol et al. (2016)'s position that communication is not an external input. Communication should be an inherent part of the design, implementation, monitoring and evaluation of a OH initiative, and not an afterthought. In the articles, various motivations for communication were highlighted, but four main arguments were raised in which communication was defined. I will discuss these in the next subsections.

Communication facilitates understanding among interdisciplinary One Health professionals, and between them and their stakeholders. One Health scientists and professionals need to communicate among themselves through sharing of information and knowledge as well as fostering strong

linkages. Creating public awareness and effectively conveying risk messages is crucial in addressing zoonotic infectious diseases, as well as in safeguarding wildlife health. For example, Decker et al. (2011) pointed out that a firm foundation for effective risk communication is built from strong interdisciplinary collaboration between wildlife and public health professionals, mediated by wildlife veterinarians.

Communication of research findings is also a concern, such as in situations where sharing of pre-published research results may be crucial in EID emergency scenarios. In this kind of situation Adams, et al. (2018) claimed that it is the decision of the scientist as to when and how the results should be communicated. It should also be left to their judgement that if the provisional research findings, clearly have an element of uncertainty, which needs to be conveyed to the relevant management authority. Jemison (2018) also argued that “success of management is not only on the communication between professional disciplines, but also between professionals and public stakeholders” (p. 505).

Communication influences people's behaviour and attitude. People's perception or understanding of risk is crucial in developing messages and implementing appropriate communication strategies. People process the information received and communication messages conveyed to them to increase their knowledge, but these may also influence their behaviour and attitudes. Cipollo, Bonizzi & Zeconi (2015) argued that health communication is commonly applied in public health, and should also be highlighted in veterinary medicine, especially in affecting behaviour and attitudinal change. They recommended that communication courses be included in veterinary medicine curricula.

Likewise, Decker et al. (2012), in their paper on public perceptions of wildlife-associated diseases, concluded that as perceived risks increased, the general public tended to isolate themselves from wildlife. This was based on a

premise that increased public awareness of wildlife diseases lead people to disassociate with wildlife (Decker et al., 2010), for instance, participating in less outdoor wildlife activities (Decker et al., 2011) and providing less support for wildlife conservation (Jemison, 2017; Roh, Rickard) for example, for bats or flying-foxes (Crockford, Dean, Reid & Dean, 2018; Lu et al., 2017).

Communication in media shapes public understanding and opinion.

Jemison (2017) argued that media is considered one of the significant sources of information and opinion as it is a platform where social definition, construction and consequences of risks are explored. Media is not only a communication tool, it also becomes a key 'actor' in shaping public views such as in outcomes of a conflict, especially issues that concern OH. For example, in the case of the Hendra media framing in Australia, Jemison (2018) in her analysis, wrote that in the Queensland government departments' media releases, the suspected or confirmed cases of Hendra and the quarantine measures being undertaken were reported. Information or messages on conservation concerns involving the human-wildlife conflict are not mentioned. In contrast to stakeholders' engagement activities, the government's messaging covers conservation concerns that were picked up by a journalist and reported in the media. In turn the lack of consistency of the government in their messaging was highlighted in the media.

The news media, in particular, takes on the role of disseminating scientific information that may affect the public's risk perception. At times, the media is accused of exaggerating risks, and causing public worry. However, Hilton and Hunt (2011) studied the UK newspapers' representations of the 2009-10 outbreak of swine flu, and concluded that the news media reported factual health information on swine 'flu as well as reporting responsibly scientific uncertainty. Hilton and Hunt also suggested in their analysis that the public may have sensed that the swine 'flu outbreak

was over-hyped in the media because of its broad coverage and not because of the unbalanced and exaggerated news reporting.

In addition to the usual print and broadcast media, Mekaru and Brownstein (2014) highlighted the potential use of social media and online social network platforms in reaching stakeholders and the public about OH communication. Mekaru and Brownstein (2014) examined online sources for OH, online community of practice (CoP) in social networking sites (e.g. LinkedIn and ResearchGate), and social media (e.g. Facebook, Twitter, and YouTube). One of their findings was that most of the OH groups in social media, specifically on Facebook, are affiliated with a university. Also among the social media sites, Twitter has the most online activities, thus a potential tool to expand CoP on OH. In LinkedIn social networking site, the One Health Initiative group has more than 2,000 members. There were also small or local research projects that employed social media and the 'citizen science' concept to build communities around OH-related research. An example is the Seabird Ecological Assessment Network (SEANET), which was initiated as a long-term collaborative effort to identify and mitigate threats to North America Atlantic marine birds. SEANET uses a blog to update its community.

Dialogue and participation among stakeholders and communities enabled by communication. The use of media is one of various means to communicate, as illustrated in the earlier discussion. In situations, however, where lack of media accessibility is an issue and the socio-cultural conditions warrant a more contextual approach, interpersonal approaches such as dialogue and community engagement suffice or are an indispensable alternative.

Bagnol, et al. (2016), in their paper "Transdisciplinary Project Communication and Knowledge Sharing in Tanzania and Zambia through a One Health Lens", characterised communication as dialogue and a participatory approach that engaged all stakeholders. Transdisciplinary

collaboration is focused on communication and synergy, rather than building a consensus (Bagnol, et al., 2016). In another OH setting dealing with zoonotic emerging infectious diseases, specifically, avian influenza and its impact on village poultry production, Alders, et al. (2014) asserted the value of understanding the human dimension of emerging infectious diseases, taking into account the social and cultural characteristics of the village poultry communities. Closely analysing communication about HPAI, Alders et al. (2014), in their study of village poultry producers and traders, found that poorly produced communication materials in which local context was not considered could result in a lack of credibility pertaining to the technical recommendations among its intended stakeholders. For effective communication, Alders et al. (2014) emphasised the value of pretesting information materials and combining participatory epidemiology tools with communication activities.

Emergent communication discourse in One Health

I analysed further the major communication findings and conclusions of the fourteen retrieved articles, and identified three emerging communication discourses in OH which will be discussed in the next subsections.

One Health messages should balance the interests of an interdisciplinary collaboration. Risk perception and communication about wildlife diseases and human-wildlife interaction dominated the literature selected in this review. The main point highlighted in these publications was that increased public awareness of the risk of wildlife animals spreading infectious diseases resulted in negative perceptions on human-wildlife interaction. These negative perceptions are a threat to wildlife populations as bats and public support for wildlife conservation is declining. For instance, in both media reporting and the development of risk messages, there was the

tendency to 'frame' the bats as villains, while humans and horses (as in the case of the Hendra virus) were the victims (Jemison, 2017; Lu, et al. 2017). Framing or representation is a common approach used in analysing the content of the stories in the media or risk information messages for science communication.

There was a growing concern among wildlife OH professionals about the need to address the negative perception of human-wildlife interaction, and to develop a balanced public-health-and-wildlife-health message or a wide-ranging 'One Health message'. As reflected in Lu et al.'s (2017) study, this is possible where messages can be designed that combine risk and/or fear with benefits, but which support the balanced messaging approach that a OH idea fosters.

Media engagement and transforming risk messages to 'news value' stories is crucial in One Health communication. The inclusion of articles that focused on framing in the media (Jemison, 2017; Hilton & Hunt, 2011) and risk communication messages (Roh, et al., 2018; Lu, et al., 2017; Crockford et al., 2018; Decker, et al., 2012) proved the importance of involving the media in OH communication. As Jemison (2017) argued, the media is an important source of information and opinion that shapes the public's perception of risk with regard to environmental issues and knowledge on EID outbreaks. It is deemed necessary, therefore, that the media, specifically journalists, are strongly encouraged to report scientific and risk information in the most appropriate way that will not create panic and mislead the public.

One of the issues that OH professionals need to address when engaging with the media is matching OH messages with news media values to create 'humanised' stories. For example, in dealing with wildlife disease management, often conservation groups and press releases from government departments tend to provide abstract information, which does not help the journalist. Because of its lack of clarity, journalists usually opt to obtain

information from others, e.g., politicians, who are easily accessible. Journalists sourcing technical information from politicians has precarious implications. Politicians may share information with journalists that may already incorporate an opinion of their own that would influence public understanding (Jemison, 2017).

One Health communication is a synergistic process. The usual communication process of consensus building is now diverted to a synergistic process of communication, especially in a OH approach where, by its interdisciplinarity nature, it is a challenge to achieve mutual understanding. Bagnol et al. (2016) pointed out:

There is a need to invest time in creating an inclusive and comprehensive communication strategy to overcome challenges, allow individuals and institutions to accept unfamiliar (and at times incompatible) views and experiences, and interact effectively with colleagues from a range of disciplinary fields. (p. 5)

Conclusion and researcher's insights

Despite a large number of papers that mention communication and one health in relation to zoonotic diseases, most of these are only very superficial in the way that they deal with these topics. There were few (14 articles) in which these issues were discussed in an integrated way. In the articles that I reviewed, Communication was also evident in OH settings in which issues on wildlife conservation or human-wildlife interaction were addressed. The terms 'One Health' and 'interdisciplinary' were more commonly used than 'Ecohealth' and 'transdisciplinary'. Social science perspectives in OH collaboration were included in the majority of the articles. However, the involvement of the communication discipline still needs to be

strengthened as not many people with a communication background were part of the interdisciplinary collaboration.

The prevailing communication topics in OH were message development, science communication and risk communication of wildlife and zoonotic diseases, and media framing. Quantitative approaches, such as survey, experiments and content analysis, composed the usual communication research methodology. In terms of geographical focus, many of the articles were centred in the United States. Communication programs and efforts applied in Asian contexts were minimal and appeared to be under-reported.

Furthermore, from my analysis of the articles, four main viewpoints on communication surfaced. These are communication:

- facilitates understanding among interdisciplinary OH professionals, and between them and their stakeholders;
- influences people's behaviour and attitude;
- uses media to shape public understanding and opinion; and
- enables dialogue and participation among stakeholders and communities

In synthesising the findings and conclusions of the articles, it was implied in the emerging discourse on communication in OH that:

- OH messages should balance the interests of an interdisciplinary collaboration;
- Media engagement and transforming risk messages to 'news value' stories is crucial in OH communication; and
- OH communication is a synergistic process.

One of my reflections on the results of this literature review is consideration for looking at the communication process as synergistic, that not necessarily leads to consensus building. I think this is a major outlook that

needs to be advocated by OH and EH professionals to fully embrace the inter- or transdisciplinary nature of such approaches in a complex system. The attitude and efforts should be engaging, practise authentic listening and reflexivity, which would result in appreciation of the differences possessed by each OH collaborator. I also found that inter- and transdisciplinary professionals need to have an open mind and improve their communication skills so that they align with a OH approach. This is especially beneficial in dealing with the media and stakeholders' engagement.

Lastly, while OH and EH approaches are widely accepted at international, regional and national levels, adoption at local levels has been more limited and also varies among countries. There is more work to be done for effective communication in local settings where many research and practical collaborative opportunities should be explored. Aside from the English language, literature presented in Asian languages could be reviewed to find out how communication in OH settings are applied. Another consideration is an intentional selection of journals that centres on work in Asia. These are opportunities that I suggest would draw socio-cultural understanding and expertise in Asian contexts.

Chapter 8: Discussion and Conclusions

Introduction

In this final chapter, I discuss and integrate four important parts of my thesis. In the first, I discuss the findings of the three research phases of my thesis. In the first research phase, I consider the socio-cultural and institutional contexts in communities that shape understanding of health risks and biosecurity, based on the ethnographic case studies in local communities in the Philippines (Chapter 5). In the second research phase, I discuss the impact of institutional arrangements in implementing communication strategies that allow multi-sectoral cooperation to address a zoonotic emerging infectious disease emergency, as reflected in Singapore's SARS case study (Chapter 6). In the third research phase, I analyse the ways in which communication is included in interdisciplinary approaches such as One Health (OH) and Ecohealth (EH), drawing on the systematic literature review in Chapter 7.

The second part of this chapter is the discussion on the integrated communication approach that I propose, to address zoonotic infectious diseases. I introduce the Synergistic Context-based Communication (SCbC) Framework, and explain the premises and elements that comprise the Framework. The findings from the three research phases and my experiential knowledge as a development communication practitioner, and later as a scholar influenced me in conceiving the Framework.

In the third part of this chapter, I synthesise the key findings of my thesis in relation to the research questions in Chapter 1. In the final part of this chapter, I articulate the implications of the findings of my thesis and the SCbC Framework to zoonotic disease program implementation, communication research, and development communication theory and practice.

Part 1: Discussion of findings

Socio-cultural and institutional contexts in understanding health risks and biosecurity to support effective communication. There are traditional practices and local institutional arrangements, especially in Southeast Asian cultures, that need to be acknowledged as socio-culturally ingrained and widely adopted by members of the communities as found in my ethnography study. In my research these socio-cultural contexts have contributed to the conceptualisation of an effective communication approach for better understanding of health risks and biosecurity. One of the unique contexts highlighted in the study was the presence of human-animal interaction in an indigenous ritual, *Cañao*. Another context was a local institutional arrangement in the villages deemed crucial for dealing with health risks and biosecurity in local communities. I discuss the details of these contexts below.

Socio-cultural contexts and critical pathways of human-animal interaction as potential health risks and biosecurity concern. In the visual ethnography study of *Cañao* (Chapter 5), human-animal interaction was apparent. From the analysis of critical pathways of potential health and biosecurity risk scenarios, three main socio-cultural contexts surfaced. The first context was sourcing and movement of the pigs used for the ritual offering. This is a biosecurity concern that will require a local mechanism to monitor and assess the health status of the pigs before their cultural use in *Cañao* ceremonies. The second context was the sanitation of materials used in the rituals. The notion of cleanliness is influenced by the presence or absence of basic hygiene requirements, such as access to clean water. I found that cleanliness can be perceived from a socio-cultural and socio-economic construct that shapes the local people's understanding and personal views on health risks. The third context was exposure to, and handling of animals. The

potential risk of disease transmission is highly probable in this context involving the practice of the indigenous ritual. Alternative practices to lower the potential risk, for instance, could include developing culturally sensitive guidelines or the use of protective clothing and gloves. However, an enabling environment to support the adoption of the alternative ways would need to be set in place.

Local institutional arrangements and community values as contexts to support health risk and biosecurity management. Collectivism is intrinsic among Asian societies as theorised as one of the traits in *Sikolohiyang Pilipino* (Filipino Psychology) (Pe- Pua and Protacio-Marcelino, 2000). Health risk and biosecurity management may be better in local settings where community values and ownership of programs are in place. This was evident in Bohol's Barangay Livestock Aide (BALA) Program that I discussed in Chapter 5. Community accountability and values formation is fundamental to BALA Program's implementation and evaluation. Local values of camaraderie, passing on the blessings received, and taking responsibility for the health of animals were promoted in the livelihood and animal health programs, for example in the Province's rabies control program. The local concept of governance was found to be important, especially in mobilising the BALA volunteers to create local awareness of disease prevention and control. Collaboration among government institutions, NGOs and people's organisations were strongly encouraged. Community participation in livelihood programs as well as disease prevention and control activities were characterised by feedback exchanges and active consultations with stakeholders.

I argue that recognising critical pathways at the human-animal interface in traditional practices, and local institutional systems that exist in the communities are important socio-cultural and institutional characteristics to consider in determining a communication approach. In particular, this

could provide important ideas for developing appropriate messages. Crafting clear and relatable messages for intended stakeholders is one of the elements of effective communication. Also integral to developing key messages is the sense of ownership of the stakeholders by involving them in the process (Alders & Bagnol, 2007; Alders et al., 2009).

National institutional arrangements that support communication strategies in zoonotic disease emergencies. The case study of Singapore's SARS outbreak experience in 2003 was used to illustrate how this country's unique institutional system, which I found to be a combination of strong political leadership and government mechanisms, supported the communication strategies used during a disease emergency scenario. I classified the communication principles drawn from the analysis of the case study in Chapter 6 into three general themes. The first theme was the treatment of information and the risk messages communicated to different stakeholders. The top-level government leaders of Singapore were transparent in sharing information about the real-time situation of the spread of SARS and the government measures undertaken to contain the virus. Further, there was a conscious effort on the part of the government to sustain the people's interest in infectious diseases. Hence, public understanding of health risks and biosecurity was part of the communication strategy where the appropriate media approach for the intended stakeholder was used. The second theme was the establishment of cooperation among different sectors and scientific disciplines. Communication and good relations among leaders managing the disease emergency and scientists, technical specialists, and media practitioners were instituted to ease information exchange; for example, at the height of the disease outbreak when update briefings were undertaken regularly. The third theme was the provision of policies that enabled communication support for a rapid response. Strong government leadership and prompt enactment of policies throughout the disease

emergency response phase contributed to efficient communication management. Resource sharing and compensation for affected stakeholders were explicitly agreed and these decisions were simply communicated. Moreover, specific activities identified in the communication strategy were based on evidence-based research that was later institutionalised.

Not to discount the fact that other countries in Southeast Asia have different forms of government, the Singapore case study illustrated that a country's unique institutional system influenced the communication approaches taken in eradicating an infectious disease in the shortest time possible. One of the obvious institutional characteristics of Singapore is the strong government control it has over the media, and in communities (Rodan, 2004). Therefore, it was easy to quickly mobilise responses, especially at the height of the outbreak where stringent measures to contain the SARS virus were necessary (Chua, 2004).

Communication in interdisciplinary One Health and Ecohealth approaches. The use of communication in OH and EH approaches from 2004 (post-SARS) to 2018 was investigated. From the systematic analysis of publications, I found that 'One Health' and 'interdisciplinary' were more commonly used terms than 'Ecohealth' and 'transdisciplinary'. Despite many superficial mentions of communication in the vast majority of publications, there was very little in-depth discussion of communication. In terms of geographical focus, there were very few mentions of communication applied in Asian contexts, and most of the publications originated from the United States.

Social science perspectives were recognised as important in interdisciplinary collaborations, such as in OH settings. However, the involvement of specialists from the communication discipline appeared to be low and therefore would need to be improved. In terms of communication topics, within publications, message development, science communication

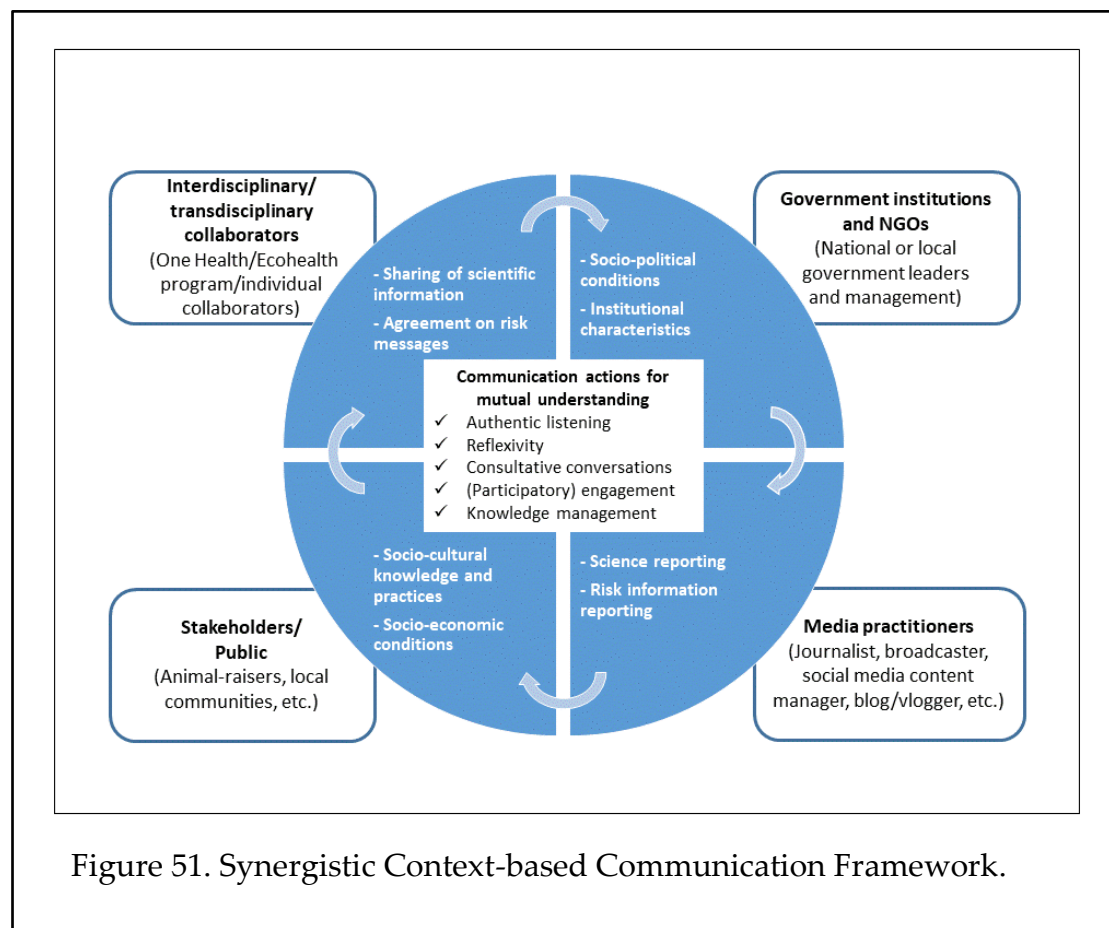
and risk communication on wildlife and zoonotic diseases, and media framing in print were usually explored. In the use of communication research methods, quantitative approaches, such as surveys, experiments and content analysis, were preferred.

Communication in OH approaches involves multiple aspects. Communication enables dialogue and participation among stakeholders and communities. It also facilitates understanding among interdisciplinary OH professionals, and among them and their stakeholders. Further, communication can be used to influence people's behaviour and attitude. In the use of media, communication was seen as crucial for shaping public understanding and opinion, especially issues concerning zoonotic diseases and human-wildlife interaction.

After further analysis, three main points emerged from the communication discourse in the OH literature. First, crafting of OH messages should be a balance between the interests of an interdisciplinary collaboration, such as developing an equitable public-health-and-wildlife-health message or a wide-ranging 'One Health message'. Second, media engagement and transforming risk messages to 'news value' stories is important in OH communication. The media is a key 'actor' in shaping public views and opinion and, therefore, cannot be ignored (Jemison, 2017; Hilton & Hunt, 2011). Third, it was found that OH communication is a synergistic process. Synergy in communication allows understanding amidst diversity of perspectives through inclusivity and open communication. A synergistic approach to communication allows two or more groups to work together to create more beneficial outcomes than by working or acting alone (Bagnol, et al., 2016). There are opportunities to expand communication in OH in research and practical collaborations, such as its adoption by local Asian communities founded on socio-cultural understanding.

Part 2: A synergistic context-based communication framework to address zoonotic infectious diseases

We are faced with complex problems, such as dealing with the risks of zoonotic infectious diseases, that require communication with inter- or transdisciplinary approaches in providing solutions. Building on my research findings in the previous section, and my learning experiences as a development communication scholar and practitioner, I propose an integrated communication approach to address zoonotic infectious diseases. I call this framework a Synergistic Context-based Communication (SCbC) as shown in Figure 51.



I developed the SCbC Framework based on two main premises. The first is that the adoption of the Framework adheres to the principle of synergy in communication based on the same premise as the work of Bagnol, et al., (2016), that is, achieving mutual understanding that may not necessarily be only through consensus among communication actors. The fact that sectors or actors would have different perspectives and contexts about the issue to hand, mutual understanding could be accomplished through agreeing to disagree and deferring to others' view for the good of the stakeholders or marginalised groups as to whom development communication is biased. Secondly, the communication process in the Framework recognises the unique contexts (e.g., social, cultural, economic, and political factors) that are reliant on the sectors or actors (e.g., stakeholders or public, media, etc.).

As illustrated in Figure 51, I assume that there are four main groups of actors in the communication process. These are inter- or transdisciplinary collaborators (who may be institutions or individuals), stakeholders or public, government institutions and non-government organisations (who may be leaders and management at varying levels), and media practitioners (who are involved in different media platforms such as print, broadcast, and internet-based media).

Each of these actors would have contexts (as depicted in the blue circular diagram in Figure 51) that need to be recognised and addressed throughout the synergistic process by adopting the communication actions for mutual understanding (as indicated in the white text box). The contexts that need to be recognised and addressed for each sector are:

- sharing of scientific information, and agreement on risk messages among the inter- or transdisciplinary collaborators;
- socio-political conditions, and institutional characteristics in government institutions and NGOs;

- socio-cultural knowledge and practices, and socio-economic conditions among stakeholders or public; and,
- science reporting, and risk information reporting among media practitioners.

These contexts are inter-related and contribute to enhancing communication with the aim to achieve synergistic, mutual understanding. Central in the Framework are communication actions for mutual understanding that I suggest are:

- authentic listening, which is an intrapersonal process that involves listening, not to think about what to respond to, but to understand deeply, and ponder on what the other is saying;
- reflexivity, which is conscious self-awareness to reflect on what 'I' have understood from the other, and what 'I' can contribute to solve the problem or resolve concerns taking into consideration what 'I' have understood from the other;
- consultative conversations, which could be meetings or dialogue with the aim to discuss inclusively the problem or issue at hand and to come up with an agreement on what to communicate or what 'I' need to learn;
- (participatory) engagement, which is similar to the aim of consultative conversations to discuss inclusively the problem or issue and what needs to be achieved. However, this action needs more time, and will involve a larger number of individuals (e.g. local community); and,
- knowledge management, which is generating and sharing of information or knowledge, both indigenous knowledge and scientific information, among the different sectors or actors.

Note that these communication actions are not mutually exclusive and their adoption may vary depending on the communication objective or contextual concerns at hand.

I emphasise that one of the attributes of the SCbC Framework that I propose is that it is a synergistic process (hence the circular diagram and arrows in Figure 51) that would have varying timelines for its adoption, depending on the complexity of the communication objectives, and the determinants of the contexts. Part of the determinants of context may also include evolving social change challenges such as sustainability, inclusivity, gender gaps, and even social justice. Say for example in the context of inclusivity, indigenous knowledge or local understanding of zoonoses in local communities should be taken into account in the synergistic process of communication without privileging of knowledge that is only “expert- or scientist-centric”. Further the process within the Framework could also be adopted in terms that are specific to the group of actors. I illustrate this in a hypothetical scenario, e.g., a given communication objective is to determine how information about rabies and wildlife health is understood in local communities to strengthen communication efforts. The main sectors are collaborators in a OH project. For the context being addressed, agreement is needed on the priority risk messages to be communicated about rabies affecting wildlife species that is based on local understanding and indigenous knowledge. Given the scenario, the quadrant sector of OH collaborators can adopt a synergistic context-based communication through communication actions such as a mix of consultative conversations, authentic listening and reflexivity. The adoption of the SCbC Framework has the potential to enhance communication about complex issues such as zoonotic diseases. As this Framework is a novel approach, it is open for testing in other situations for communication of complex issues.

Part 3: Synthesis of key findings

In this thesis, I addressed four research questions (Chapter 1). Guided by the theories of social construction of reality (Berger & Luckmann, 1966), and risk and culture (Douglas & Wildavsky, 1982) as well as Asiatic (Miike, 2006) and development communication perspectives (Quebral, 2002; Quebral, 2006; Quebral, 2012), I answered the research questions through qualitative field research (ethnography and case studies) and a systematic literature review. In this section, I synthesise the key findings through answering each of my research questions.

Research question 1: What are the socio-cultural and institutional characteristics that contribute to contextual understanding of health risks and biosecurity in Philippine communities? From observations in selected communities in the Philippines, I found that indigenous practices, constructs about the notion of hygiene, local institutional capacities, and community values were the socio-cultural and institutional characteristics that contributed to contextual understanding of health risks and biosecurity. Indigenous practices such as rituals or ceremonies that have human-animal interaction need to be examined. The exposure to, handling of, and sourcing of animals for cultural use were observed. The constructs around the notion of hygiene or cleanliness needs to be recognised for a contextual view about the risks to health. I agree with Douglas (1966/2005) that cleanliness is a relative construct, and that the notion of risk can be based on cultural understanding (Douglas & Wildavsky, 1983), which was apparent in my study on the *Cañao* ritual. As the ritual involves human-animal interactions, *Cañao* is a traditional practice that may pose health risks and biosecurity concerns. Further analysed in my field observations is that cleanliness is a relative construct that can be influenced by socio-economic conditions and an enabling environment that would allow the practice of good hygiene. Institutional characteristics, such as local capacities of village level workers

(VLW) is an important consideration. My analysis on the case of the BALA in Bohol was used to support claims that VLW have communication roles in the agriculture sector (Habermann, 1978) and in enhancing public awareness on animal disease control (ECTAD, 2009; Ballard, 2005; Mondry, et al., 2005). Furthermore community values are significant in the contextual understanding of health risks and biosecurity. Identifying local capacity will be important to supporting the need for better understanding of health risks and biosecurity concerns in the communities. Furthermore, giving importance to community values proved to be essential in empowering the leaders and members of the communities to improve practices concerning health and biosecurity. It is necessary to pay attention to socio-cultural and institutional characteristics while our global health landscape constantly evolves. I argue that cultural traditions in local communities may not be viewed as a health threat from the perspective of community members, but this can change over time through enhanced communication.

Research question 2: What institutional arrangements influence the choice of communication approaches to address zoonotic emerging infectious diseases in disease emergencies, as in the case study of SARS in Singapore? It was revealed in the analysis of the SARS outbreak experience in Singapore that institutional arrangements related to: level of political influence; type of governance; enabling policies that support immediate response capacities; regard for sustaining public interest on emerging infectious diseases; and, media relations were key considerations in selecting the communication approaches to use in a disease emergency situation. The one-party, semi-democratic type of government system of Singapore contributed to the communication strategy that was adopted during the SARS outbreak. It was easy for the government to quickly enact policies for prompt disease response because of such institutional arrangements as found in my research on the Singapore SARS outbreak case study. Further, the ability of

the different government ministries to establish collaborative mechanisms, hence coordination, especially in a disease emergency scenario, was ideal due to the institutional arrangement of the country. At the height of the SARS outbreak, the government was very clear as to the main objective of containing the disease and eliminating the virus in the fastest time possible. I found that government leaders and Singaporeans were fully aware of the negative impact of the SARS outbreak on the country's economy, and more importantly, on the life of its people. Because of this, there was a clear motivation and a general message about what to communicate to the various stakeholders and the public. There was a conscious effort on the part of the government's communication managers who were dealing with the SARS outbreak to sustain the interest of the people on emerging infectious diseases. Therefore, they continued to implement public awareness activities, especially among the younger generation. The crucial role of the media was also highlighted in this study. During the outbreak, the media informed the public about the current disease situation as well as the measures the government was taking. The public was also told what to do to support the measures of the government, and help eliminate SARS. The key messages were very important in a disease outbreak situation. As the Singapore government had influence on its media, the messages were easily conveyed to the public. Arguably, there is no 'one strategy that fits all'. However, in this study it has been demonstrated that a country's institutional capacity is significant to what could potentially work for an appropriate communication strategy in a zoonotic disease emergency scenario. The main principles could be applied to other countries with different approaches to governance.

Research question 3: What are the emerging issues in communicating health risks and biosecurity in the context of zoonotic diseases? The main issue found is the under-recognition of socio-cultural and institutional conditions relevant to health risks and biosecurity that is crucial in

communication. I have articulated this point in my previous writings (Llarena, Edwards, Surma, Fitch & Benigno, 2012; Alcos, Caro, Llarena and Benigno, 2002). I further suggest that appropriate messages should be developed through in-depth exploration of traditional knowledge and practices pertaining to human-animal-environment interactions, and determining stakeholders or local people's own understanding on the concepts of hygiene and biosecurity. One of the challenges of effective communication is message development (Alders & Bagnol, 2007; Crockford, et al., 2018; Decker, et al., 2010; Decker, et al., 2011; Decker, et al., 2012; Hanisch-Kirkbride, et al., 2013; Lu, et al., 2017). Reflecting on the results of my field data, I found that aside from getting the right messages across, another issue is providing an enabling environment for effective communication. The enabling environment needs to be in place to prevent conflict and confusion among stakeholders. For example, if the practice of cleaning and disinfection of animal premises is one of the key messages about biosecurity, it is crucial that in conveying this message, the intended audience or stakeholders have access to water and affordable disinfectants.

Research question 4: What are the emerging gaps for appropriately communicating inter- and transdisciplinary approaches such as OH and EH in the context of addressing zoonotic diseases? Risk perception of stakeholders was one of the gaps that needs to be addressed in communication (Decker, et al., 2010; Hanisch-Kirkbride, et al., 2013). Part of resolving this is developing OH messages that have the balanced content of public-animal-environment health concerns. Another emerging gap is capacity for science communication (Roh, et al., 2018) and media relations (Hilton & Hunt, 2011). I qualify science communication in two settings: one is communication among inter- and transdisciplinary scientists and collaborators; two is communication between inter- and transdisciplinary scientists or collaborators and the stakeholders. The sharing of information

among inter- and transdisciplinary scientists and collaborators is important especially in providing current research findings that have implications for policy and health management. Further, it is important to enhance the development of OH messages that are essential for effective communication between the collaborators or scientists and the stakeholders. Media relations capacity, particularly between the scientists or government authorities and media practitioners, needs to be improved. There are essential communication skills that need to be enhanced. These include techniques to develop messages and scientific content for scientists or government authorities that would cater to media news values, as well as skills for risk and science reporting for media practitioners that are factual, yet do not create public worry. Therefore, a Synergistic Context-based Communication Framework is proposed to address the emerging issues in communicating health risks and biosecurity as well as the communication gaps in inter- and transdisciplinary approaches.

Part 4: Significance of the findings and proposed Synergistic Context-based Communication

Implications for a zoonotic disease program implementation.

Communication is an integral part of zoonotic disease control programs (Alders, et al., 2014; Alders and Bagnol, 2007; Alders et al., 2009). My findings from this study would be valuable inputs in creating a communication strategy that specifically addresses communication needs in zoonotic disease management and in emergencies. I have provided insights for considering socio-cultural and institutional characteristics in developing messages that will enhance understanding of health risks and biosecurity. Findings from my study, and specifically the Philippines case study, can be used for the development of local biosecurity policy and local guidelines on disease monitoring of animals used for cultural use. Further, the findings from this

thesis can be used to contribute to additional insights on adopting communication strategies that takes into account the unique institutional characteristics of the country in responding to disease emergencies.

Implications for communication and interdisciplinary research. In my thesis, I explored multiple communication research methods in investigating communication and culture. My use of visual ethnography in the study to analyse traditional local practices that focussed on the human-animal interface was a novel approach. Also, the findings from the systematic literature review are unique as not many studies have been done where communication and One Health in the context of zoonotic diseases have been discussed. Furthermore, my thesis is a practical attempt to conduct interdisciplinary communication research given the research supervision and theoretical principles that guided my research.

Implications for Development Communication theory and practice. Quebral (2012) justified that the changes in the definition of Devcom over time is the consequence of the ongoing reflection of the social processes of development and communication. I relate to Quebral's articulation that my conceptualisation of the Synergistic Context-based Communication Framework was an ongoing reflection on the social and cultural processes that I found in my field data and in my evaluation of the literature in communication and OH.

Quebral (2006) also explained that Devcom's aim is not only for public information but is a means to motivate different levels of stakeholders to act on the information received to make the communication successful. The SCbC Framework follows this aim as it is recognized in this Framework that different actors and sectors would undergo a synergistic communication process.

The SCbC is a contribution to the body of knowledge in the development communication discipline. Development communication

practitioners may adopt this Framework and evaluate its pragmatic use in the communication of development projects. It should not be limited to health programs but may have value in other development issues involving complex science such as in biotechnology and climate change resilience.

Conclusion

In this thesis, I researched the significance of communication in addressing complex issues, such as zoonotic diseases. The need to recognise the significance of socio-cultural and institutional contexts for understanding health risks and biosecurity in order to enable effective communication is confirmed by the findings. There is a need for continuous and improved investment in communication to address complex global issues that demand inter- or transdisciplinary approaches. The adoption of the Integrated Communication Framework, Synergistic Context-based Communication, proposed in this thesis is an approach to strengthen communication initiatives in relation to disease emergencies and related biosecurity issues.

Further, I recommend in future research that the adoption of One Health and Ecohealth may also be critiqued and analysed in-depth to strongly argue that such frameworks are indeed best practices of an inter- and transdisciplinary holistic approaches in addressing complex problems such as in addressing zoonotic diseases.

The SCbC framework that I proposed in this thesis is a work in progress that is very much open for scrutiny. Future research that may be explored related to the framework is how the different elements would work in different situations not only applicable in One Health and Ecohealth. Another potential area for research is the extent of synergy among collaborators (i.e. scientists, media practitioners or journalists, policy makers, local community members) given the divergence in understanding perceived risks and different motivations of communication.

References

- Adams, M. J., Harris, R. N., Grant, E. H. C., Gray, M. J., Camille Hopkins, M., Iverson, S. A., . . . Waddle, H. (2018). Prepublication communication of research results. *Ecohealth*, 15(3), 478-481. doi:10.1007/s10393-018-1352-3
- Adams, V., Novotny, T. E., & Leslie, H. (2008). Global health diplomacy. *Medical Anthropology*, 27(4), 315-323. doi:10.1080/01459740802427067
- Arguin, P. M., Navin, A. W., Steele, S. F., Weld, L. H., & Kozarsky, P. E. (2004). Health communication during SARS. *Emerging Infectious Diseases*, 10(2), 377-380. doi:10.3201/eid1002.030812
- Ahmad, K. (2000). Malaysia culls pigs as nipah virus strikes again. *The Lancet*, 356(9225), 230.
doi:http://dx.doi.org.libproxy.murdoch.edu.au/10.1016/S0140-6736(05)74483-4
- Alcos, M. A. V., Caro, D. D., Llarena, E., & Benigno, C. (2002). Communication Management in the Control and Eradication of FMD in the Philippines. *The FMD Monitor: Special Research Journal Edition* (pp. 116-124). Quezon City: Bureau of Animal Industry.
- Alders, R., Awuni, J. A., Bagnol, B., Farrell, P., & de Haan, N. (2014). Impact of avian influenza on village poultry production globally. *Ecohealth*, 11(1), 63-72. doi:10.1007/s10393-013-0867-x
- Alders, R. G., & Bagnol, B. (2007). Effective communication: The key to efficient HPAI prevention and control. *World's Poultry Science Journal*, 63(1), 139-147. doi:10.1017/S0043933907001365
- Alders, R. G., Bagnol, B., Brum, E., Lubis, A. S., & Young, M. P. (2009). Continuing education in the prevention and control of HPAI: A case study on Indonesia. *World's Poultry Science Journal*, 65(3), 529-531. doi:10.1017/S0043933909000397

- American Psychological Association. (2010). *Publication Manual of the American Psychological Association* (6th ed.). Washington, DC: American Psychological Association.
- Angrosino, M. (2007). *Qualitative research kit: Doing ethnographic and observational research*. London: SAGE Publications Ltd doi: 10.4135/9781849208932
- Arnoldi, J. (2009). *Risk: An introduction*. Cambridge, UK: Polity Press.
- AsiaOne. (2012, July 31). *MCYS, MICA to be restructured*. Retrieved from <http://www.asiaone.com>
- Asia-Pacific Economic Cooperation. (2004). *The impact of SARS on the Singapore economy and action taken in response*. Retrieved from <http://www.worldscientific.com>
- Australian Government Department of Agriculture. (2018). *Biosecurity*. Retrieved from <http://www.agriculture.gov.au/biosecurity>
- Bagnol, B., Clarke, E., Li, M., Maulaga, W., Lumbwe, H., McConchie, R. . . . Alders, R. G. (2016). Transdisciplinary project communication and knowledge sharing experiences in Tanzania and Zambia through a one health lens. *Frontiers in Public Health*, 4, 10-10. doi:10.3389/fpubh.2016.00010
- Ballard, B. M. (2005). *Farm-level bureaucrats in action (and inaction): the distribution of veterinary services in Laos and Cambodia*. Unpublished Ph.D. Thesis. Massachusetts Institute of Technology, Department of Urban Studies and Planning.
- Bateson, G., & Mead, M. (1942). *Balinese character, a photographic analysis*. [New York: The New York academy of sciences].
- Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, 13(4), 544-559.
- Beck, U. (1999). *World Risk Society*. Malden, Massachusetts: Polity Press.

- Beck, U. (2006). Living in the world risk society: A Hobhouse Memorial Public Lecture given on Wednesday 15 February 2006 at the London School of Economics. *Economy and Society*, 35(3), 329-345.
- Berger, P.L., & Luckmann, T. (1966). *The social construction of reality: A treatise in the sociology of knowledge*. London: Penguin Books.
- Berlo, D. K., 1929. (1960). *The process of communication: An introduction to theory and practice*. San Francisco: Holt, Rinehart P.
- Blog Sociology. (2014, October 6). *The social construction of reality*. Retrieved from <https://blogsociology.wordpress.com/2014/10/06/the-social-construction-of-reality/>
- Bolinto, R. (2013, July 17). Cañao: Heart of the Cordilleran culture [Web log post]. Retrieved from <http://www.icbe.eu/articles/248-canao-heart-of-the-cordilleran-culture>
- Bowman, G.L. & Shulaw, W.P. (2001). On-farm biosecurity: Traffic control and sanitation [Web log post]. Retrieved from <https://ohioline.osu.edu/factsheet/vme-6>
- Bresalier, M., Cassidy, A., & Woods, A. (2015). One health in history. In Zinsstag, J., Schelling, E., & Waltner-Toews, D. (Eds.). *One health: The theory and practice of integrated health approaches* (pp. 22-38). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Brewer, J. D. (2000). *Ethnography*. Buckingham: Open University Press.
- Bsal Europe. (2019). Mitigating Batrachochytrium salamandrivorans in Europe. Retrieved from <http://bsaleurope.com/>
- Bunch, M.J., & Waltner-Toews, D. (2015). Grappling with complexity: The context for one health and the ecohealth approach. In Zinsstag, J., Schelling, E., & Waltner-Toews, D. (Eds.). *One health: The theory and practice of integrated health approaches* (pp. 39-50). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>

- Burnette, R.N., Hess, J.E., Kozlovac, J.P., & Richmond, J.Y. (2013). Defining biosecurity and related concepts. In Burnette, R.N. (Ed.) *Biosecurity: Understanding, assessing, and preventing the threat* (pp. 3-16). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Burnette, R. N., Reed, J. C., & Delarosa, P. (2013). The Future of Biosecurity: A Global Context. In Burnette, R.N. (Ed.) *Biosecurity: Understanding, assessing, and preventing the threat* (pp. 259-269). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Cadiz, M.C.H. (2018, November). *Strengthening the Devcom discipline and practice: Challenges and opportunities*. Plenary presentation at the Association of Development Communication Educators and Practitioners (ADCEP) 1st international conference and 8th annual scientific meeting, "Devcom in Borderless Societies", UPLB College Laguna Philippines.
- Canadian Food Inspection Agency. (2018). *National Biosecurity Standard for Livestock, Poultry and Deadstock Transportation: Introduction*. Retrieved from <http://www.inspection.gc.ca/animals/terrestrial-animals/biosecurity/standards-and-principles/transportation/eng/1519235033628/1519235183948?chap=1#s1c1>
- Capua, I., Alexander, D. J., Rideout, B. A., & Vincent, M. (2008). The Changing Epidemiology of Avian Influenza. In G. Smith & A. M. Kelly (Eds.), *Food Security in a Global Economy* (pp. 101-118). Philadelphia: University of Pennsylvania Press.
- Caro, D. III, Edwards, J., Fitch, K., Surma, A., & Morzaria, S. (2012). Animal health communication in Southeast Asia. In Adams L.B., Gray G.D and Murray G. (Eds.). *Animal biosecurity in the Mekong: Future directions for research and development*. Proceedings of a workshop held, 10 - 13 August, 2010, Siem Reap, Cambodia. ACIAR Proceedings No. 137, pp.

- 90-92. Canberra: Australian Centre for International Agricultural Research.
- Centers for Disease Control and Prevention. (2018). *Hand, foot, and mouth disease (HFMD)*. Retrieved from <http://www.cdc.gov/hand-foot-mouth/disease>
- Centers for Disease Control and Prevention. (2017). *Influenza (Flu): Types of Influenza Viruses*. Retrieved from <https://www.cdc.gov/flu/about/viruses/types.htm>
- Chan, H. C. (1975). *Politics in an administrative state: where has the politics gone?* (pp. 294-306). Singapore: Department of Political Science, University of Singapore.
- Chavers, L.S. & Vermund, S.H. (2007). An introduction to emerging and reemerging infectious diseases. In Lashley, F. R., & Durham, J. D. (Eds.). *Emerging infectious diseases: Trends and issues* (6th ed., pp. 3-24). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Chen, G.-M. (2006). Asian Communication Studies: What and Where to Now. *Review of Communication*, 6(4), 298-311.
- Cheng, Y. C. (2004). Fostering local knowledge and human development in globalization of education. *The International Journal of Educational Management*, 18(1), 7-24.
- Cheng, C.Y. (2003). SARS @TTSH (Part 9). *SMA News*, 35 (12), pp. 10-13.
- Chitnis K. and Mansoor O. 2007. *Role of communication in avian pandemic influenza programme*. Background paper presented to a Technical Meeting on Highly Pathogenic Avian Influenza and Human H5N1 Infection, 27–29 June 2007, Rome. Retrieved from <http://www.fao.org/docs/eims/upload//229374/ah659e.pdf>
- Choi, B. C. K., & Pak, A. W. P. (2006). Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 1. definitions, objectives, and evidence of effectiveness. *Clinical*

- and Investigative Medicine*, 29(6), 351-64. Retrieved from <http://libproxy.murdoch.edu.au/login?url=https://search-proquest-com.libproxy.murdoch.edu.au/docview/196425990?accountid=12629>
- Chu, G. C. (1988). In Search of an Asian Perspective of Communication Theory. In W. Dissanayake (Ed.), *Communication Theory: The Asian Perspective* (pp. 204-210). Singapore: The Asian Mass Communication Research and Information Centre.
- Chua, M.H. (2004). *A defining moment: How Singapore beat SARS*. Singapore: Institute of Policy Studies.
- Cipolla, M., Bonizzi, L., & Zecconi, A. (2015). From “One health” to “One communication”: The contribution of communication in veterinary medicine to public health. *Veterinary Sciences*, 2(3), 135-149. doi:10.3390/vetsci2030135
- Claridge, G. F., & (compiler) (1996). *An Inventory of Wetlands of the Lao PDR*. Bangkok. Thailand: IUCN.
- Collier Jr., J. (2003). Photography and visual anthropology. In Hockings, P. (Ed.). *Principles of visual anthropology* (pp. 235-254). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Collier, S.J., & Lakoff, A. (2008). The problem of securing health. In Lakoff, A., & Collier, S. (Eds.). *Biosecurity interventions: Global health and security in question* (pp. 7-32). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Conrad, P. A., Mazet, J. A., Clifford, D., Scott, C., & Wilkes, M. (2009). Evolution of a transdisciplinary “One Medicine–One health” approach to global health education at the university of california, davis. *Preventive Veterinary Medicine*, 92(4), 268-274. doi:10.1016/j.prevetmed.2009.09.002
- Cornell University Library (2018). *A guide to systematic reviews*. Retrieved from http://guides.library.cornell.edu/systematic_reviews/intro

- Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among five approaches* (3rd ed.). Los Angeles: SAGE Publications.
- Creswell, J. W. (2007). *Qualitative inquiry & research design: Choosing among five approaches* (2nd ed.). Thousand Oaks: Sage Publications.
- Crockford, C. N., Dean, A. J., Reid, S., & Dean, J. H. (2018). Conservation values and risk of handling bats: Implications for one health communication. *Ecohealth*, 15(3), 682-687. doi:10.1007/s10393-018-1356-z
- Cumming, D.H.M., & Cumming, G.S. (2015). One health: An ecological and conservation perspective. In Zinsstag, J., Schelling, E., & Waltner-Toews, D. (Eds.). *One health: The theory and practice of integrated health approaches* (pp. 66-83). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Curry, J., Huss-Ashmore, R., Perry, B., & Mukhebi, A. (1996). A framework for the analysis of gender, intra-household dynamics, and livestock disease control with examples from uasin gishu district, kenya. *Human Ecology*, 24(2), 161. Retrieved from <http://libproxy.murdoch.edu.au/login?url=https://www-proquest-com.libproxy.murdoch.edu.au/docview/206003882?accountid=12629>
- Datamonitor. (2004). *Singapore: country profile*. Retrieved from <http://www.datamonitor.com>
- Davis, R.G. (2011). *Animals, diseases, and human health: Shaping our lives now and in the future*. Santa Barbara, California: Praeger.
- Dance, F. E. X. (1967). *Human communication theory: Original essays*. Holt, Rinehart and Winston.
- Decker, D. J., Evensen, D. T. N., Siemer, W. F., Leong, K. M., Riley, S. J., Wild, M. A., . . . Higgins, C. L. (2010). Understanding risk perceptions to enhance communication about human-wildlife interactions and the impacts of zoonotic disease. *ILAR Journal*, 51(3), 255-261. doi:10.1093/ilar.51.3.255

- Decker, D. J., Siemer, W. F., Evenson, D. T., Stedman, R. C., McComas, K. A., Wild, M. A., ... & Leong, K. M. (2012). Public perceptions of wildlife-associated disease: risk communication matters. *Human–Wildlife Interactions*, 6(1), 13. doi:10.26077/8nz7-x725
- Decker, D. J., Siemer, W. F., Wild, M. A., Castle, K. T., Wong, D., Leong, K. M., & Evensen, D. T. N. (2011). Communicating about zoonotic disease: Strategic considerations for wildlife professionals. *Wildlife Society Bulletin*, 35(2), 112-119. doi:10.1002/wsb.29
- de Haan, N. (2001). Of goats and groups: A study on social capital in development projects. *Agriculture and Human Values*, 18 (1), pp.71–84. <https://doi-org.libproxy.murdoch.edu.au/10.1023/A:1007633501969>
- de Haan, C., & Steinfeld, H. P. (2008). The Livestock Revolution and the Developing World. In G. Smith & A. M. Kelly (Eds.), *Food Security in a Global Economy: Veterinary Medicine and Public Health* (pp. 33-42). Philadelphia: University of Pennsylvania Press.
- Delabougise, A., Antoine-Moussiaux, N., Tatong, D., Chumkaeo, A., Binot, A., Fournié, G., . . . Peyre, M. (2017;2016;). Cultural practices shaping zoonotic diseases surveillance: The case of highly pathogenic avian influenza and thailand native chicken farmers. *Transboundary and Emerging Diseases*, 64(4), 1294-1305. doi:10.1111/tbed.12506
- Delgado, C., Rosegrant, M., Steinfeld, H. P., Ehui, S., & Courbois, C. (1999). *Livestock to 2020: The Next Food Revolution*. Washington, DC: International Food Policy Research Institute.
- Department of the Interior and Local Government. (2013). *Reports and resources*. Retrieved from <https://www.dilg.gov.ph/reports-and-resources/seal-of-good-local-governance/12/>
- Department of the Interior and Local Government (DILG) – Western Visayas. (2014). *Seal of good local governance (SGLG)*. Retrieved from

<http://www.region6.dilg.gov.ph/index.php/programs/63-accountable-lgus/410-seal-of-good-local-governance-sglg>

- Dissanayake, W. (Ed.). (1988). *Communication Theory: The Asian Perspective*. Singapore: The Asian Mass Communication Research and Information Centre.
- Do, T. (2017, October 27). Duck blood (tiet canh vit) in Vietnam [Web log post]. Retrieved from <https://scootersaigontour.com/duck-blood-tiet-can-h-vit-in-vietnam/>
- Douglas, M., 1921-2007, & ebrary, I. (1992;1 994; 2002;). *Risk and blame: Essays in cultural theory*. London; New York: Routledge.
doi:10.4324/9780203430866
- Douglas, M., & Wildavsky, A. (1983). *Risk and culture: An essay on the selection of technological and environmental dangers*. Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Dutta, M. J. (2007). Communicating about culture and health: Theorizing culture-centered and cultural sensitivity approaches. *Communication Theory*, 17(3), 304-328. doi:10.1111/j.1468-2885.2007.00297.x
- Dutta, M. J. (2018). Culturally centering social change communication: subaltern critiques of, resistance to, and re-imagination of development. *Journal of Multicultural Discourses*, 13(2), 87-104.
<https://doi.org/10.1080/17447143.2018.1446440>
- Ear, S. (2009). *Cambodia's patient zero: The political economy of foreign aid and avian influenza*. Retrieved from <https://siepr.stanford.edu/research/publications/cambodia-s-patient-zero-political-economy-foreign-aid-and-avian-influenza>
- Emergency Centre for Transboundary Animal Disease (ECTAD) (2009). Cambodia: How village animal health workers and village chiefs are helping to prevent avian influenza. *Regional ECTAD News*. Retrieved from <http://www.fao.org/docrep/012/ak767e/ak767e00.pdf>

- Edwards, P. (2014, March). *Can Influenza A Virus Fly?* Keynote address presented at the conference of Rural Health Wealth, “Celebrating 25 Years—Caring Beyond Health”, Pan Pacific Perth.
- Food and Agriculture Organization of the United Nations. (2007). *FAO Biosecurity Toolkit*. Retrieved from <http://www.fao.org/3/a1140e/a1140e00.htm>
- Food and Agriculture Organization of the United Nations. (2009). *Highly Pathogenic Avian Influenza and beyond: FAO's response towards one world, one health*. Retrieved from http://www.fao.org/ag/againfo/resources/en/publications/agapubs/HPAI_and_beyond.pdf
- Food and Agriculture Organization of the United Nations. (2011). *One Health: Seeing around corners (A regional communication strategy framework against infectious diseases in Asia and the Pacific 2011-2016)*. Retrieved from <http://www.fao.org/3/an167e/an167e00.pdf>
- Food and Agriculture Organization of the United Nations. (2013). *Lessons from HPAI: A technical stocktaking of outputs, outcomes, best practices and lessons learned from the fight against highly pathogenic avian influenza in Asia 2005-2011*. Retrieved from <http://www.fao.org/3/i3183e/i3183e00.htm>
- FAO, OIE, WHO, UNSIC, UNICEF & World Bank. (2008). *Contributing to One World, One Health: A strategic framework for reducing risks of infectious diseases at the animal-human-ecosystems interface*. Retrieved from <http://www.fao.org/3/aj137e/aj137e00.pdf>
- Fidler, D. P. (1996). Globalization, International Law, and Emerging Infectious Diseases. *Emerging Infectious Diseases*, 2(2), 77-84.
- Frazier, T.W. (2010). Food and agriculture biosecurity. In Katona, P., Sullivan, J. P., & Intriligator, M. D. (Eds.). *Global biosecurity: Threats and responses* (pp. 61-91). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>

- Fouchier, R. A. M., Osterhaus, A. D. M. E., & Brown, I. H. (2003). Animal influenza virus surveillance. *Vaccine*, 21(16), 1754-1757.
doi:[http://dx.doi.org.libproxy.murdoch.edu.au/10.1016/S0264-410X\(03\)00067-7](http://dx.doi.org.libproxy.murdoch.edu.au/10.1016/S0264-410X(03)00067-7)
- Frazier, T.W. (2010). Food and agriculture biosecurity. In Katona, P., Sullivan, J. P., & Intriligator, M. D. (Eds.). *Global biosecurity: Threats and responses* (pp. 61-91). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Freire, P., 1921-1997, & Ramos, M. B. (2011). *Pedagogy of the oppressed* (30th anniversary ed.). New York: Continuum.
- Frey, L. R., Botan, C. H., Friedman, P. G., & Kreps, G. L. (1992). *Interpreting communication research: A case study approach*. Prentice Hall International.
- Gerring, J. (2006). *Case study research: Principles and practices*. Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Gibbs, E. P. J. (2014). The evolution of one health: A decade of progress and challenges for the future. *Veterinary Record*, 174(4), 85-91.
doi:10.1136/vr.g143
- Giddens, A. (2002). *Runaway World: How globalisation is reshaping our lives*. London: Profile Books.
- Gobo, G. (2008). *Doing ethnography*. Los Angeles, California: Sage.
- Goonasekera, A. (1995). *What is development communication?* Churchlands, W.A.: Centre for Development Studies, Edith Cowan University.
- Griffin, E. A. (2012). *A first look at communication theory* (8th ed.). New York: McGraw-Hill.
- Gudykunst, W. B., Ting-Toomey, S., & Chua, E. (1988). *Culture and interpersonal communication*. Newbury Park, California: Sage Publications.

- Habermann, D. (1978). Village Level Workers: The Grassroots Communicators. In P. Habermann & G. de Fontgalland (Eds.), *Development Communication: Rhetoric and Reality* (pp. 58-72). Singapore: Asian Mass Communication Research and Information Centre.
- Hall, E. T. (1981). *Beyond Culture*. New York: Anchor Books.
- Hammersley, M., & Atkinson, P. (2007). *Ethnography: Principles in practice*. Routledge.
- Hanaki, T. (2003). [Review of the book *Non-western perspectives on human communication: Implications for theory and practice*, by M.-S. Kim]. *Howard Journal of Communication*, 14(3), 191-194.
- Hanisch-Kirkbride, S. L., Riley, S. J., & Gore, M. L. (2013). Wildlife disease and risk perception. *Journal of Wildlife Diseases*, 49(4), 841-849.
doi:10.7589/2013-02-031
- Hickler, B. (2007). *Bridging the gap between HPAI "awareness" and practice in Cambodia*. Bangkok: Emergency Centre for Transboundary Animal Disease (ECTAD), FAO Regional Office for Asia and the Pacific.
- Hilton, S., & Hunt, K. (2011). UK newspapers' representations of the 2009 – 10 outbreak of swine flu: One health scare not over-hyped by the media? *Journal of Epidemiology and Community Health* 65(10), 941-946.
doi:10.1136/jech.2010.119875
- International Office of Epizootics. (2009). One world, one health: Summary of the FAO/OIE/WHO document. *OIE Bulletin*, 2, pp. 3-7. Retrieved from https://www.oie.int/fileadmin/Home/eng/Publications_%26_Documentation/docs/pdf/bulletin/Bull_2009-2-ENG.pdf
- Jacknis, I. (1988). Margaret Mead and Gregory Bateson in Bali: Their Use of Photography and Film. *Cultural Anthropology*, 3(2), 160-177. Retrieved from <http://www.jstor.org.libproxy.murdoch.edu.au/stable/656349>
- Jasanoff, S. (1993). Bridging the two cultures of risk analysis 1, 2. *Risk analysis*, 13(2), 123-129. Retrieved from <https://onlinelibrary-wiley->

com.libproxy.murdoch.edu.au/doi/epdf/10.1111/j.1539-6924.1993.tb01057.x

- Jemison, M. (2017). Communication considerations for one health: The influence of media framing on representations of a human-bat disease conflict in the Australian print media. *Australian Zoologist*, 38(4), 505-517. doi:10.7882/AZ.2017.002
- Jesson, J., Matheson, L., & Lacey, F. (2011). *Doing your literature review: Traditional and systematic techniques*. Los Angeles: Sage.
- Johns Hopkins University. (2016). *SBCC for Emergency Preparedness Implementation Kit*. Retrieved from <https://sbccimplementationkits.org/sbcc-in-emergencies/learn-about-sbcc-and-emergencies/>
- Johnson, N.P.A.S. & Mueller, J. (2002). Updating the accounts: Global mortality of the 1918-1920 "Spanish" influenza pandemic. *Bulletin of the History of Medicine*, 76, 105-115.
- Jones, K.E., Patel, N.G., Levy, M.A., Storeygard, A., Balk, D., Gittleman, J.L., & Daszak, P. (2008). Global trends in emerging infectious diseases. *Nature*. 451, 990-994. doi: 10.1038/nature06536
- Kaplan, S. (1997). The words of risk analysis. *Risk analysis*, 17(4), 407-417. Retrieved from <https://onlinelibrary-wiley-com.libproxy.murdoch.edu.au/doi/epdf/10.1111/j.1539-6924.1997.tb00881.x>
- Kaplan, S., & Garrick, B. J. (1981). On the quantitative definition of risk. *Risk analysis*, 1(1), 11-27. Retrieved from <https://onlinelibrary-wiley-com.libproxy.murdoch.edu.au/doi/epdf/10.1111/j.1539-6924.1981.tb01350.x>
- Kilbourne, E.D. (2006). Influenza Pandemics of the 20th Century. *Emerging Infectious Diseases*, 12(1), 9-14.

- Kim, M.-S. (2002). *Non-Western Perspectives on Human Communication: Implications for Theory and Practice*. Thousand Oaks, California: Sage Publications Inc.
- Kincaid, L. D. (Ed.). (1987). *Communication Theory: Eastern and Western Perspectives*. San Diego, California: Academic Press Inc.
- Kincaid, L.D. (1979). *The Convergence of Communication*. Papers of the East-West Communication Institute No. 18 (p.41). Honolulu, Hawaii: East-West Center.
- Kleinman, A. M., Bloom, B. R., Saich, A., Mason, K. A., & Aulino, F. (2008). Asian flus in ethnographic and political context: A biosocial approach. *Anthropology & Medicine*, 15(1), 1-5. doi:10.1080/13648470801918968
- Kobrin, S. J. (2008). Globalization: what caused it, and how will it end? In G. Smith & A. M. Kelly (Eds.), *Food Security in a Global Economy: Veterinary Medicine and Public Health* (pp. 27-32). Philadelphia: University of Pennsylvania Press.
- Lam, S.K. & Chua, K.B. (2002). Nipah Virus Encephalitis Outbreak in Malaysia. *Clinical Infectious Diseases*, 34, S48-S51. Retrieved from <http://www.jstor.org.libproxy.murdoch.edu.au/stable/4483084>
- Langhorne, R. (2001). *The coming of globalization: its evolution and contemporary consequences*. New York: Palgrave.
- Lapiz, S. M. D. (2008). *Barangay Livestock Aide Program of Bohol*. PowerPoint Presentation for ULAP meeting (n.d.).
- Lapiz, S.M., Miranda, M.E., Garcia R., Daguro L., Paman M., Madrinan F., Rances P., Bohol Rabies Prevention and Elimination Council Members & Briggs D. (2012a). A 'showcase model' canine rabies prevention and elimination programme: The Bohol Rabies Prevention and Elimination Program In *Rabies Control – Towards Sustainable Prevention at the Source: Compendium of the OIE Global Conference on Rabies Control, 7–9 September*

- 2011, *Incheon-Seoul (Republic of Korea)*. Retrieved from <https://www.oie.int/doc/ged/d12061.pdf>
- Lapiz, S. M. D., Miranda, M. E. G., Garcia, R. G., Daguro, L. I., Paman, M. D., Madrinan, F. P., . . . Briggs, D. J. (2012b). Implementation of an intersectoral program to eliminate human and canine rabies: The Bohol rabies prevention and elimination project. *PLoS Neglected Tropical Diseases*, 6(12), e1891-e1891. doi:10.1371/journal.pntd.0001891
- Lashley, F. R. (2007). Categories and Highlights of Significant Current Emerging Infectious Diseases. In F. R. Lashely & J. D. Durham (Eds.), *Emerging Infectious Diseases* (2nd ed., pp. 49-82). New York: Springer Publishing Company.
- Lasswell, H. D. (1948). The structure and function of communication in society. *The communication of ideas*, 37(1), 136-39. Retrieved from <http://www.irfanerdogan.com/dergiweb2008/24/12.pdf>
- Leavy, P. (2017). *Research design: Quantitative, qualitative, mixed methods, arts-based, and community-based participatory research approaches*. London; New York: Guilford Press.
- Lee, G. O. M., & Warner, M. (2008). *The political economy of the SARS epidemic: The impact on human resources in East Asia*. London: Routledge.
- Lerner, D. (1958). *The passing of traditional society: Modernizing the Middle East*. New York; London: Free P.
- Ligalig, M.O. (2017, September 30). Bohol town declared rabies-free zone in PH. *Rappler*. Retrieved from <https://www.rappler.com/nation/183896-bohol-town-rabies-free-zone>
- Link, K. (2007). *Understanding new, resurgent and resistant diseases: how man and globalization create and spread illness*. London: Praeger.
- Littlejohn, S. W. (1999). *Theories of human communication* (6th ed.). Belmont, CA: Wadsworth Pub.

- Littlejohn, S. W., & Foss, K. A. (2008). *Theories of human communication* (9th ed.). Belmont, CA: Thomson/Wadsworth.
- Llarena, E. DC. (2006). *Communicating risk: A study on the knowledge on Foot and Mouth Disease (FMD) risks and communication management in the maintenance of FMD-free areas in Visayas and Mindanao*. (Unpublished master's thesis). University of the Philippines, Diliman Quezon City.
- Llarena, E., & Benigno, C. (2002). Exploring the Use of Theater as an Intervention Tool for FMD Control. *The FMD Monitor: Special Research Journal Edition* (pp. 132-135). Quezon City: Bureau of Animal Industry.
- Llarena, E., Edwards, J., Surma, A., Fitch, K., & Benigno, C. (2012). Making sense of local knowledge and indigenous practices on health and biosecurity risk management. In Adams L.B., Gray G.D and Murray G. (Eds.). *Animal biosecurity in the Mekong: Future directions for research and development. Proceedings of a workshop held, 10 - 13 August, 2010, Siem Reap, Cambodia. ACIAR Proceedings No. 137*, pp. 90-92. Canberra: Australian Centre for International Agricultural Research.
- Lu, H., McComas, K. A., Buttke, D. E., Roh, S., Wild, M. A., & Decker, D. J. (2017). One health messaging about bats and rabies: How framing of risks, benefits and attributions can support public health and wildlife conservation goals. *Wildlife Research*, 44(3), 200. doi:10.1071/WR16061
- Lundgren, R. E., & McMakin, A. H. (2018). *Risk communication: A handbook for communicating environmental, safety, and health risks*. John Wiley & Sons.
- Lupton, D. (1999a). *Risk*. London: Routledge.
- Lupton, D. (Ed.). (1999b). *Risk and sociocultural theory: new directions and perspectives*. Cambridge: Cambridge University Press.
- Lynas, D., Goater, S., Griffin, M., Moore, A., Logrosa, G., Kamanga, E., & Pearce, M. (2014). Water-related safety, health and sanitation of artisanal and small-scale miners and the affected communities (IM4DC Action Research Report). Retrieved from International Mining for

- Development Centre website <https://www.im4dc.org/wp-content/uploads/2015/05/Building-linkages-to-maximise-IM4DC-funding-final-Completed-Report.pdf>
- Macgill, S. M., & Siu, Y. L. (2005). A new paradigm for risk analysis. *Futures*, 37(10), 1105-1131.
- Mak, P.W.Y., Jayawardena, S., & Poon, L.L.M. (2012). The evolving threat of Influenza viruses of animal origin and the challenges in developing appropriate diagnostics. *Clinical Chemistry*, 58(11), 1527-1533.
- Manabe, T., Tran, T. H., Doan, M. L., Do, T. H. V., Pham, T. P. T., Dinh, T. T. H., . . . Kudo, K. (2012). Knowledge, attitudes, practices and emotional reactions among residents of avian influenza (H5N1) hit communities in vietnam. *PloS One*, 7(10), e47560. doi:10.1371/journal.pone.0047560
- Manyozo, L. (2006). Manifesto for Development Communication: Nora Quebral and the Los Baños School of Development Communication. *Asian Journal of Communication*, 16(1), 79–99. <http://doi-org.libproxy.murdoch.edu.au/10.1080/01292980500467632>
- Marano, N., Arguin, P. M., & Pappaioanou, M. (2007). Impact of Globalization and Animal Trade on Infectious Disease Ecology. *Emerging Infectious Diseases*, 13(12), 1807-1809.
- Marketline. (2017). Country profile series: Singapore in-depth PESTLE insights. Retrieved from <http://www.marketline.com>
- Mason, M. (2005, November 4). Asian countries take extreme – sometimes odd – measures to ward off bird flu. *The Canadian Press*. Retrieved April 19, 2019, from Factiva.
- Mav Khun Chantha Heng Md.Harun-Or-Rashid Hideki Kasuya Junichi Sakamoto. (2012). Knowledge, attitudes and practices towards avian influenza A(H5N1) among cambodian women: A cross-sectional study. *亚太热带医药杂志: 英文版*, 5(9), 727-734. doi:10.1016/S1995-7645(12)60115-1

- Mayhew, S. (Ed.). (2015). *A dictionary of geography* (5th ed.). Oxford: Oxford University Press. doi: 10.1093/acref/9780199680856.001.0001
- Mazet, J. A. K., Clifford, D. L., Coppolillo, P. B., Deolalikar, A. B., Erickson, J. D., & Kazwala, R. R. (2009). A "one health" approach to address emerging zoonoses: The HALI project in Tanzania. *PLoS Medicine*, 6(12), e1000190-e1000190. doi:10.1371/journal.pmed.1000190
- McCrea, D. (2005). Risk communication related to animal products derived from biotechnology. *Revue scientifique et technique-Office international des épizooties*, 24(1), 141.
- McPhail, T. L. (Ed.). (2009). *Development communication: Reframing the role of the media*. Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Mekaru, S. R., & Brownstein, J. S. (2014). One health in social networks and social media. *Revue Scientifique Et Technique (International Office of Epizootics)*, 33(2), 629-637.
- Melkote, S.R. (2018). Communication for development and social change: An introduction. *Journal of Multicultural Discourses*, 13(2), 77-86. doi:10.1080/17447143.2018.1491585
- Menon, K. U. (2005). National Resilience: From Bouncing Back to Prevention. *Ethos*, 11(1), 14-17. Retrieved from <https://www.cscollge.gov.sg/Knowledge/Ethos/Issue%201%20Jan%202005/Pages/06National.pdf>
- Menon, K. U. (2006). SARS revisited: Managing "outbreaks" with "communications". *Annals of the Academy of Medicine, Singapore*, 35(5), 361.
- Menon, V. (1988). Preface. In W. Dissanayake (Ed.), *Communication Theory: The Asian Perspective* (pp. ix-x). Singapore: The Asian Mass Communication Research and Information Centre.

- Miike, Y. (2007). An Asiacentric reflection on Eurocentric bias in communication theory. *Communication Monographs*, 74(2), 272-278.
- Miike, Y. (2006). Non-western theory in western research? An Asiacentric agenda for Asian communication studies. *Review of Communication*, 6(1-2), 4-31.
- Miike, Y. (2002). Theorizing culture and communication in the Asian context: An assumptive foundation. *Intercultural Communication Studies*, XI (1), 1-21.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, 6(7), e1000097-e1000097. doi:10.1371/journal.pmed.1000097
- Mondry, R., Constant, P., Chantasay, C., & Kallabinski, J. (2005). Village Veterinary Worker Network as a Private Sector Approach. *Improving Livelihoods in the Uplands of the Lao PDR*. Retrieved from [http://www.mekonginfo.org/mrc_en/doclib.nsf/0/2BDE2B639D4DA54C47257181003D8AE3/\\$FILE/FULLTEXT215.pdf](http://www.mekonginfo.org/mrc_en/doclib.nsf/0/2BDE2B639D4DA54C47257181003D8AE3/$FILE/FULLTEXT215.pdf)
- Moore, P. (2006). *The new killer germs: what you need to know about deadly diseases of the twenty-first century*. London: Carlton Books.
- Morens, D. M., & Fauci, A. S. (2013). Emerging infectious diseases: Threats to human health and global stability: E1003467. *PLoS Pathogens*, 9(7) doi:http://dx.doi.org.libproxy.murdoch.edu.au/10.1371/journal.ppat.1003467
- Morens, D.M., & Fauci, A.S. (2007). The 1918 Influenza Pandemic: Insights for the 21st Century. *The Journal of Infectious Diseases*, 195(7), 1018-1028. Retrieved from <http://www.jstor.org/stable/30086034>
- Morens, D. M., Folkers, G. K., & Fauci, A. S. (2004). The challenge of emerging and re-emerging infectious diseases. *Nature*, 430, 242-249.

- Muniandy, N., & Aziz, J. A. (2004). Effects of intensification of the traditional farming system on the environment and bio-safety of the human population: Nipah virus outbreak in Malaysia. *Kyoto Area Studies on Asia*, 8, 303-318.
- Naing Oo, K., & Robertson, I. (2013). *Epidemiology of foot and mouth disease in Myanmar*. LAP LAMBERT Academic Publishing.
- Nguyen-Viet, H., Doria, S., Tung, D. X., Mallee, H., Wilcox, B. A., & Grace, D. (2015). Ecohealth research in southeast asia: Past, present and the way forward. *Infectious Diseases of Poverty*, 4(1), 5. doi:10.1186/2049-9957-4-5
- OIE World Animal Health Information Database. (2018). *Detailed country disease incidence: Rabies – Philippines*. Retrieved from https://www.oie.int/wahis_2/public/wahid.php/Diseaseinformation/statusdetail
- One World, One Health. (n.d.). *About “One World, One Health”*. Retrieved from <http://www.oneworldonehealth.org/index.html>
- Ooi, P. L., Lim, S., & Chew, S. K. (2005). Use of quarantine in the control of SARS in Singapore. *AJIC: American Journal of Infection Control*, 33(5), 252-257. doi:10.1016/j.ajic.2004.08.007
- O'Reilly, K. (2005). *Ethnographic methods*. London: Routledge.
- Padmawati, S., & Nichter, M. (2008). Community response to avian flu in central java, Indonesia. *Anthropology & Medicine*, 15(1), 31-51. doi:10.1080/13648470801919032
- Papineau, J.L. (2003, October). The Singapore Can-Lah Campaign. Retrieved from <https://www.iccaworld.org/nlps/story.cfm?nlid=45>
- Paul, M. C., Figuié, M., Kovitvadhi, A., Valeix, S., Wongnarkpet, S., Poolkhet, C. . . . Binot, A. (2015). Collective resistance to HPAI H5N1 surveillance in the thai cockfighting community: Insights from a social anthropology study. *Preventive Veterinary Medicine*, 120(1), 106-114. doi:10.1016/j.prevetmed.2015.02.021

- Pe-Pua, R., & Protacio-Marcelino, E. (2000). Sikolohiyang Pilipino (Filipino psychology): A legacy of Virgilio G. Enriquez. *Asian Journal of Social Psychology*, 3, 49-71.
- Perez, U.C. (1979). *The social world of the Ibalays* (Unpublished doctoral dissertation). Benguet State University, Baguio City.
- Pernia, E. E. (2004). *Communication research in the Philippines: Issues and methods*. Quezon City: University of the Philippines Press.
- Petrie, H. (1976). Do You See What I See? The Epistemology of Interdisciplinary Inquiry. *Educational Researcher*, 5(2), 9-15. Retrieved from <http://www.jstor.org.libproxy.murdoch.edu.au/stable/1174278>
- Philippines' National Statistics Office. (June 2013). *Bohol Quickstat*. Retrieved from https://psa.gov.ph/sites/default/files/attachments/ird/quickstat/Bohol_13.pdf
- Pink, S. (2007). *Doing visual ethnography: Images, media, and representation in research* (2nd ed.). London: Sage Publications.
- Piotrow, P. T., Kincaid, D. L., Rimon II, J. G., & Rinehart, W. (1997). *Health communications: Lessons from family planning and reproductive health*. Westport, USA: Praeger Publishers.
- Pollack, M.P. (2010). The role of informal information sources as an adjunct to routine disease surveillance. In Katona, P., Sullivan, J. P., & Intriligator, M. D. (Eds.). *Global biosecurity: Threats and responses* (pp. 201-216). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Provincial Government of Bohol. (2007). 2007 in Review: Office of the Provincial Veterinarian (provincial government internal document).
- Provincial Government of Bohol. (2008). Tracer survey of awarded programs (provincial government internal document).

- Provincial Government of Bohol, Philippines Australia Human Resource Development Facility, and Orient Integrated Development Consultants Inc. (n.d.). Bohol Agriculture Master Plan CY 2006-2026. Retrieved from <https://ppdo.bohol.gov.ph/plan-reports/development-plans/bohol-agriculture-master-plan-bamp-2006-2026/>
- Public Health Agency of Canada. (2009). *One World One Health: From ideas to action (Report of the Expert Consultation)*. Retrieved from <http://www.onehealthglobal.net/resources/key-publications/>
- Puri, A. (2003). Dancing on tables in singapore's guided democracy: Article view. *Contemporary Review (London)*. Incorporating International Review and the Fortnightly, 282(1649), 351.
- Quebral, N. C. (2006). Development Communication in the Agricultural Context (1971, with a new foreword). *Asian journal of Communication*, 16(1), 100-107. Retrieved from <https://www-tandfonline-com.libproxy.murdoch.edu.au/doi/full/10.1080/01292980500467657>
- Quebral, N. C. (2002). *Reflections on development communication: 25 years after*. Los Baños: UPLB College of Development Communication.
- Quebral, N. C. (2012). *Development communication primer*. Penang, Malaysia: Southbound. Retrieved from <http://www.southbound.com.my/downloads/QuebralCruzPrimer2012.pdf>
- Rahim, L. Z. (2008). Winning and Losing Malay Support: PAP--Malay Community Relations, 1950s--1960s. In Barr, M.D. & Trocki, C.A. *Paths Not Taken: Political Pluralism in Post--War Singapore*, 95-115. University of Hawaii Press.
- Reid, A.H., Taubenberger, J.K., & Fanning, T.G. (2001). The 1918 Spanish influenza: Integrating history and biology. *Microbes and Infection*, 3, 81-87.

- Reuters Health E-Line. (2005, April 4). Vietnamese has bird flu after drinking duck blood. Retrieved April 19, 2019, from Factiva.
- Reuters News. (2005, April 5). Two bird flu suspects in hospital in Vietnam. Retrieved April 19, 2019, from Factiva.
- Richards, L. & Morse, J. M. (2013). *Readme first for a user's guide to qualitative methods*. (2nd ed.). Los Angeles: Sage.
- Rimi, N. A., Sultana, R., Ishtiaq-Ahmed, K., Khan, S. U., Sharker, M. A. Y., Zaman, R. U., . . . Luby, S. P. (2014). Poultry slaughtering practices in rural communities of Bangladesh and risk of avian influenza transmission: A qualitative study. *Ecohealth*, 11(1), 83-93.
doi:10.1007/s10393-013-0885-8
- Rodan, G. (1993). *Singapore changes guard: Social, political and economic directions in the 1990s*. New York: St. Martin's Press.
- Rodan, G. (2008). Singapore "Exceptionalism"? Authoritarian rule and State Transformation. In Friedman, E., 1937, & Wong, J. *Political transitions in dominant party systems: Learning to lose*. London: Routledge.
- Rodan, G. (2004). Transparency and authoritarian rule in Southeast Asia: Singapore and Malaysia. Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Rogers, E. M. (1962). *Diffusion of innovations*. New York: Free Press of Glencoe.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.
- Roh, S., Rickard, L. N., McComas, K. A., & Decker, D. J. (2018). Public understanding of one health messages: The role of temporal framing. *Public Understanding of Science*, 27(2), 185-196.
doi:10.1177/0963662516670805
- Rojo-Laurilla, M. (2002). The School-on-the-Air (SOA) on FMD: The Philippine Experience. *The FMD Monitor: Special Research Journal Edition* (pp. 125-131). Quezon City: Bureau of Animal Industry.

- Roman, R. (2005). The place of theory in development communication: Retrospect and prospects. *Annals of the International Communication Association*, 29(1), 311-332. doi:10.1080/23808985.2005.11679051
- Rupprecht, C., Wang, L.-F., & Real, L.A. (2008). In G. Smith & A. M. Kelly (Eds.), *Food Security in a Global Economy: Veterinary Medicine and Public Health* (pp. 145-155). Philadelphia: University of Pennsylvania Press.
- Schelling, E. & Zinsstag, J. (2015). Transdisciplinary research and one health. In Zinsstag, J., Schelling, E., & Waltner-Toews, D. (Eds.). *One health: The theory and practice of integrated health approaches* (pp. 466-474). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Schramm, W. L., 1907. (1964). *Mass media and national development: The role of information in the developing countries*. Stanford: Stanford U.P.
- Schramm, W. & Roberts, D.F. (1971). The Nature of Communication between Humans (reproduced from *The Process and Effects of Mass Communication*, pp.17-34) in *Agricultural Extension and Communication I Readings* 1977, pp. 94-105. College, Laguna: UPLB-CA Department of Development Communication.
- Scoones, I. & Forster, P. (2008). The International Response to Highly Pathogenic Avian Influenza: Science, Policy and Politics. *STEPS Working Paper 10*. Brighton: STEPS Centre. Retrieved from <https://steps-centre.org/publication/the-international-response-to-highly-pathogenic-avian-influenza-science-policy-and-politics/>
- Scott, W. H. (1974). *The discovery of the Igorots: Spanish contacts with the pagans of northern Luzon*. Quezon City, Philippines: New Day Publishers.
- Seki, K. (1971). The circle of On, Giri, and Ninjo: Sociologist's point of view. 北海道大學文學部紀要= *The annual reports on cultural science*, 19(2), 99-114. Retrieved from

[https://eprints.lib.hokudai.ac.jp/dspace/bitstream/2115/33354/1/19\(2\)_PL99-114.pdf](https://eprints.lib.hokudai.ac.jp/dspace/bitstream/2115/33354/1/19(2)_PL99-114.pdf)

- Serafica, R. (2014). *DILG introduces 'seal of good local governance'*. Retrieved from <https://www.rappler.com/move-ph/issues/budget-watch/48073-dilg-seal-good-local-governance>
- Servaes, J., 1952. (2008). *Communication for development and social change*. Thousand Oaks, Calif;New Delhi, India;: Sage.
- Shao, H. (2012). The evolution of influenza viruses. *Health*, 4, 1000-1005. doi: 10.4236/health.2012.430153
- Slovic, P. (1987). Perception of Risk. *Science*, 236(4799), 280-285. Retrieved from <http://www.jstor.org.libproxy.murdoch.edu.au/stable/1698637>
- Slovic, P. (2016). *The perception of risk*. Routledge.
- Singapore Department of Statistics. (2004). *Singapore resident population, 2003-2007*. Retrieved from <https://www.singstat.gov.sg//media/files/publications/population/respop.pdf>
- Singapore Department of Statistics. (2018). *Population trends, 2018*. Retrieved from <https://www.singstat.gov.sg//media/files/publications/population/population2018.pdf>
- Sipress, A. (2005, April 14). Bird flu ads new danger to bloody game; cockfighting among Asian customs that put humans at risk. *The Washington Post*. Retrieved April 19, 2019, from Factiva.
- Sorenson, E.R. & Jablonko, A. (2003). Research filming of naturally occurring phenomena: Basic strategies. In Hockings, P. (Ed.). *Principles of visual anthropology* (pp. 235-254). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Tan, M. L. (2008). *Revisiting usog, pasma, kulam* (student edition). Quezon City: The University of the Philippines Press.

- Tapdasan, E. P., & Salces, C. B. (2016). Hemorrhagic septicemia prevalence and vaccination coverage in Bohol, Philippines, January 2011 to July 2012. *Philippine Journal of Veterinary and Animal Sciences*, 42(1).
- Tao, J. & Tieu, B. (2017 May 19). Vietnamese consuming wild animal meat, blood as sexual tonics driving some species to extinction. *Xinhuanet*. Retrieved from http://www.xinhuanet.com/english/2017-05/19/c_136298841.htm
- Taubenberger, J.K. & Morens, D.M. (2006). 1918 Influenza: The mother of all pandemics. *Emerging Infectious Diseases*, 12(1), 15-22.
- Tehrani, M. (1994). Communication and development. In Crowley, D. J., & Mitchell, D. (Eds.). *Communication theory today*, (pp. 274-306). California: Stanford University Press.
- The Freeman. (2017). *Bohol gets 3rd SGLG award, Tagbilaran its first*. Retrieved from <https://www.philstar.com/the-freeman/region/2017/12/01/1764590/bohol-gets-3rd-sglg-award-tagbilaran-its-first>
- Ting-Toomey, S. (1988). Intercultural Conflict Styles: A Face-Negotiation Theory. In Y. Y. Kim & W. B. Gudykunst (Eds.), *Theories in intercultural communication* (pp. 213-235). Newbury Park, California: Sage Publications.
- Ting-Toomey, S. (Ed.). (1994). *The Challenge of Facework: Cross-Cultural and Interpersonal Issues*. New York City: State University of New York Press.
- Torres, C. S., & Manyozo, L. (2018). Asian Contributions to Communication for Development and Social Change. *Handbook of Communication for Development and Social Change*, (pp. 1-21). Retrieved from https://link.springer.com/content/pdf/10.1007/978-981-10-7035-8_22-1.pdf

- Tutas, R. (2016, November 22). P74-million livestock distributed to Bohol towns. *The Bohol Chronicle*. Retrieved from <http://www.boholchronicle.com.ph>
- Unger, F. 2015. *Ecohealth perspectives: From Ecohealth theory to practice (case studies)*. Presented at an FAO-APHCA/OIE/USDA Regional Workshop on Prevention and Control of neglected Zoonoses in Asia, Obihiro, Hokkaido, Japan, 15-16 July 2015. Nairobi, Kenya: ILRI.
- Valdivia, C. (2001). Gender, livestock assets, resource management, and food security: Lessons from the SR-CRSP. *Agriculture and Human Values*, 18 (1), pp. 27–39. <https://doi-org.libproxy.murdoch.edu.au/10.1023/A:1007613031102>
- Valente, A. C. (2005). [Review of the book *Non-western perspectives on human communication: Implications for theory and practice*, by M.-S. Kim]. *Discourse Society*, 16(4), 587-588.
- van de Fliert, E. 2006. The role of the farmer field school in the transition towards sustainable agriculture. In Van den Ban, A.W. and Samanta, R.K. (Eds.), *Changing Roles of Agricultural Extension in Asian Nations* (pp. 325–342). New Delhi: B.R. Publishing Corporation.
- van de Fliert, E., Dung, N. T., Henriksen, O., & Dalsgaard, J. P. T. (2007). From collectives to collective decision-making and action: Farmer field schools in Vietnam. *The Journal of Agricultural Education and Extension*, 13(3), 245-256. doi:10.1080/13892240701427706
- Velasco, M.T.H., Cadiz, M.C.H. & Lumanta, M.F. (n.d.) *Module 2 of DEVC 208, Communication and Social Marketing*. University of the Philippines Open University.
- Veterinarians without Borders Canada. (2010). *One health for one world: A compendium of case studies*. Retrieved from <https://idl-bnc-idrc.dspacedirect.org/handle/10625/50649>

- Vorou, R., Papavassiliou, V., & Tsiodras, S. (2007). Emerging zoonoses and vector-borne infections affecting humans in Europe. *Epidemiology and Infection*, 135(8), 1231-1247. doi:10.1017/S0950268807008527
- Waisbord, S. (2001). *Family Tree of Theories, Methodologies and Strategies in Development Communication: Convergences and Differences*. The Rockefeller Foundation.
- Wang, L.-F. & Cramer, G. (2014). Emerging zoonotic viral diseases. *Rev. sci. tech. Off. int. Epiz.* 33(2), 569-581.
- Wang, L.F., Shi, Z., Zhang, S., Field, H. E., Daszak, P., & Eaton, B. T. (2006). Review of Bats and SARS. *Emerging Infectious Diseases*, 12(12), 1834-1840. <https://dx.doi.org/10.3201/eid1212.060401>
- Webster, R.G., Bean, W.J., Gorman, O.T., Chambers, T.M., & Kawaoka, Y. (1992). Evolution and ecology of Influenza A viruses. *Microbiological Reviews*. 56(1), 152-179. Retrieved from <https://mmbr.asm.org/content/membr/56/1/152.full.pdf>
- Webster, R., & Walker, E. (2003). Influenza: The world is teetering on the edge of a pandemic that could kill a large fraction of the human population. *American Scientist*, 91(2), 122-129. Retrieved from <http://www.jstor.org.libproxy.murdoch.edu.au/stable/27858180>
- Widdowson, M.-A., Bresee, J.S., Jernigan, D.B. (2017). The Global Threat of Animal Influenza Viruses of Zoonotic Concern: Then and Now. *The Journal of Infectious Diseases*, Volume 216 (S4), S493–S498, <https://doi.org/10.1093/infdis/jix331>
- Willig, C. (2014). Interpretation and analysis. In Flick, U. *The SAGE handbook of qualitative data analysis* (pp. 136-150). London: SAGE Publications Ltd doi: 10.4135/9781446282243
- Winn, L. (2005). [Review of the book *Non-western perspectives on human communication: Implications for theory and practice*, by M.-S. Kim]. *The Southern Communication Journal*, 70(2), 171-172.


- World Bank, Food and Agriculture Organization of the United Nations, and International Fund for Agricultural Development. (2008). *Gender in agriculture sourcebook*. ProQuest Ebook Central
<https://ebookcentral.proquest.com>
- World Health Organization. (2018a). *Cumulative number of confirmed human cases for avian influenza A (H5N1) reported to WHO, 2003-2018*. Retrieved from
http://www.who.int/influenza/human_animal_interface/2018_12_13_tableH5N1.pdf?ua=1
- World Health Organization. (2005). *Outbreak communication: Best practices for communicating with the public during an outbreak*. Retrieved from
<http://apps.who.int/iris/handle/10665/69138>
- World Health Organization. (2018b). *Summary of probable SARS cases with onset of illness from 1 November 2002 to 31 July 2003*. Retrieved from
http://www.who.int/csr/sars/country/table2004_04_21/en/
- World Health Organization. (2018c). *Influenza (seasonal): The pathogen*. Retrieved from [http://www.who.int/news-room/fact-sheets/detail/influenza-\(seasonal\)](http://www.who.int/news-room/fact-sheets/detail/influenza-(seasonal))
- World Health Organization. (2018d). *Nipah virus: Key facts*. Retrieved from
<http://www.who.int/news-room/fact-sheets/detail/nipah-virus>
- World Health Organization. (2018e). *Morbidity and mortality due to Nipah or Nipah-like virus encephalitis in WHO South-East Asia Region, 2001-2018*. Retrieved from
http://www.searo.who.int/entity/emerging_diseases/links/morbidity-and-mortality-nipah-sear-2001-2018.pdf?ua=1
- Xiang, N., Shi, Y., Wu, J., Zhang, S., Ye, M., Peng, Z., . . . Yu, H. (2010). Knowledge, attitudes and practices (KAP) relating to avian influenza in urban and rural areas of china. *BMC Infectious Diseases*, 10(1), 34-34. doi:10.1186/1471-2334-10-34

- Yob, J. M., Field, H., Rashdi, A. M., Morrissy, C., van der Heide, B., Rota, P., ... & Ksiazek, T. (2001). Nipah virus infection in bats (order Chiroptera) in peninsular Malaysia. *Emerging infectious diseases*, 7(3), 439.
- Zinsstag, J., Mackenzie, J.S., Jeggo, M., Heymann, D.L., Patz, J.A., & Daszak, P. (2012). Mainstreaming one health. *Ecohealth*, 9(2), 107-110.
doi:10.1007/s10393-012-0772-8
- Zinsstag, J., Schelling, E., Bonfoh, B., Fooks, A. R., CBiol, FiBiol, Kasymbekov, J., Waltner-Toews, D., & Tanner, M. (2009). Towards a 'One health' research and application tool box. *Veterinaria Italiana*, 45(1), 121-133.
- Zinsstag, J., Schelling, E., Waltner-Toews, D., & Tanner, M. (2011). From "one medicine" to "one health" and systemic approaches to health and well-being. *Preventive Veterinary Medicine*, 101(3-4), 148-156.
doi:10.1016/j.prevetmed.2010.07.003
- Zinsstag, J., Waltner-Toews, D., & Tanner, M. (2015). Theoretical issues of one health. In Zinsstag, J., Schelling, E., & Waltner-Toews, D. (Eds.). *One health: The theory and practice of integrated health approaches* (pp. 39-50). Retrieved from <https://ebookcentral-proquest-com.libproxy.murdoch.edu.au>
- Zoonoses. (2008). In B. W. Lerner & K. L. Lerner (Eds.), *In Context Series. Infectious Diseases: In Context* (Vol. 2, pp. 935-937). Detroit, MI: Gale. Retrieved from <http://link.galegroup.com.libproxy.murdoch.edu.au/apps/doc/CX3045200267/GVRL?u=murdoch&sid=GVRL&xid=14cb4e40>

Appendices

Appendix A

Coordination letter sent to the Provincial Veterinarian of Benguet


Murdoch
UNIVERSITY

13 November 2008

Hon. Nestor B. Fongwan
Governor
Office of the Provincial Governor
Provincial Capitol, La Trinidad
Benguet

Attention: Ruben Cayad-an, DVM
Provincial Veterinarian

Dear Sir:

I am a PhD Candidate at Murdoch University in Western Australia undertaking research on crisis and risk communication in response to zoonotic emerging infectious diseases (i.e. Bird Flu, SARS, etc.) in Southeast Asia. Specifically, I am looking into the socio-cultural and institutional factors that affect crisis and risk communication in this context focusing on two countries in the region – Philippines and Lao PDR. Currently, I am in my final phase of the study and will be conducting my second round of field work. In this phase of my research I am keen to engage with local stakeholders and immerse in communities/villages to explore indigenous knowledge, traditional practices and norms of animal-raising, hygiene and management of health/biosecurity risks. As a case province in Luzon, I have selected the Province of Benguet where I will conduct interviews and/or group discussions and observe the local field situations in target communities relevant to my research.

In this regard I would like to request assistance in the conduct of my research in the Province. Your recommendations on how to go about in my field work and your official endorsement enabling me to engage with local people in the communities/barangays would be very much appreciated. I will be in Benguet from **18 to 22 November 2008** for a courtesy visit and an initial meeting to discuss in detail the activities I intend to do in the field.

I hope that this correspondence will merit a positive response from your good office.

Yours sincerely,

Elaine Larena, BSDC, MA (Univ. of the Phils.)

PhD Candidate, Murdoch University

Email: E.Larena@murdoch.edu.au

Contact Number (in the Philippines): +639216993754

Noted:

Prof. John Edwards (sgnd)
Dean and Principal Research Supervisor
School of Veterinary and Biomedical Science
Email: John.Edwards@murdoch.edu.au

DISCOVERERS WELCOME

Appendix B

Interview guide used in the ethnography study in the Philippines

Type of informants: village animal health volunteers (BALA in Bohol province)

1. Introduction

The researcher introduces herself and her PhD research project, explaining the aims of the study including the conduct of ethnography.

2. Socio-demographic details:

- a. What is your name and age? (optional)
- b. What is your educational attainment? (optional)
- c. Do you also raise animals?

3. Background information as village health volunteer (assigned BALA):

- a. How long have you been serving as BALA or village volunteer?
- b. How did you become a village volunteer or assigned as BALA in your barangay?
- c. Have you attended trainings before being a BALA or village volunteer? Were you supposed to undergo a training course first as a requirement to being a village volunteer or BALA?

4. Role as BALA or village volunteer

- a. Have you encountered problems being a BALA and in your volunteer work?
- b. How do you resolve the challenges met?

5. Concluding remarks (other insights)

Appendix C

Sample field notes entry

30 October 2008, 5:30 a.m.
 @ Avela (BABA) residence
 → we arrive but it was raining and as we have to wait for the rain to stop.
 pagtabang papers
 taking notes

29-30th OFV dry frame workshop

31 OCT; 10 a.m. → Meeting of BABA Presidents

27 attendees → representing each municipality
 Chairman → presiding

Arsonio Ingo
 Diker
 Erion

OFV staff

Acknowledging
 BABA President → 47 towns of BABA
 President → BABA → BABA accounts of Director's Office
 Mr. Elpidio Redoran → Pres. BO (24)
 Mr. Roger Pongay → Sec

→ 2 in introduction among BABA presidents
 meeting by → BABA
 → BABA accounts of Barangay Director's Office
 2nd Sept '08
 → reading of minutes of the meeting

Jir Sanfran Village

BABA Congress 2009

Agenda:
 - Minutes of the previous meeting
 → Report of the Treasurer

Discussion: How do BABA get their funds?
 monthly dues of barangay BABA member
 BABA Coordinator from OFV is present

Robert [unclear]
 Robertmilar L. Galero → "cot"

BO-27

The monthly meeting became a venue to raise problem / concern / issues of BABA.

→ money matter → monthly dues
 → BABA representatives - e.g. endorsement of barangay cap.
 - when barangay cap. change BABA change too
 - transfer BABA
 → support given for MAB / Barangay govt.

25 → registration
 60 → yearly dues (75 / month)

→ schedule of BABA reporter
 → outline of monthly accomplishment reports, evidence - monitoring reports, etc.

BO-28

Grp. Interview #1

Covered this part for informants' anonymity

Municipality	# of grps. BABA
CELESTES	8 grps.
PALILIHAN	10 grps.
VALENCIA	1 grp.
Pilar	11 grps.
DUMANO	11 grps.
CATIGBAHAN	11 grps.
S-Bulones	11 grps.
Davis	12 grps.
LAOY	12 grps.
SAWISIDAN	10 grps.

Kalabaw, baka, bating, yacatin, muna
 1-2 5 baka

→ registration: dunnis, purge
 → by [unclear] [unclear] in [unclear]
 → [unclear]:
 → [unclear] of [unclear] - not outside
 → [unclear] for fuel, etc.

→ committed any [unclear] as
 by [unclear] [unclear] of [unclear] [unclear]
 di [unclear] as [unclear] a technician or [unclear]

BO-29

Label number	Running time	Date of field work and location	Context of the video and other details	Description of the video	Remarks
23 1	0081121175541 0:12:05	Nov. 22, 2008 C. Benguet Hospital Sports Center	Culminating Activity of the Advisory 2008 is the Grand Carao held in the morning, attended by the Governor and Head of the Provincial Administration together w/ other guest staff.	Mt of two ^{guest} native pigs lying on a concrete floor surrounded by 3 men kneeling around the manning (most of the priest or else who perform the ritual) - the manning is dressed modern w/ traditional torba head dress and scarf of traditional u-trabi cloth/fabric. - prior to the ceremony that everything is prepared by the men. - as men approached and when the ceremony begins a hole (big) knife a slit will be cut through the side of the pig close to its heart in a woman pig called "mukit" is inserted inside the throat area of the body to make the blood flow the pig alive.	

Label number	Running time	Date of field work and location	Context of the video and other details	Description of the video	Remarks
-ds-	-ds-	-ds-	-ds-	once the pig is immobile, placed it over transducer to the fire that the man plugs for a few minutes and plugs to each side to turn on before the procedure. The man then wipers off the hair using wash or alcohol.	
24	20081121180752	0:12:27	-ds-	-ds-	For the man preparing long sticks to be used in the the pig hair.
2			-ds-	-ds-	OR Bone Bands; fire over transducer the pig and place it on top of deer wild grassy field branches. The man cut open the pig on top the liver, heart and brought it to the manubrium; while the other man continued to cut open the pig exposing all the the internal and organs.

Appendix E

Sample coordination letter sent to the Ministries in Singapore



www.murdoch.edu.au

November 12, 2007

Minister Khaw Boon Wan
Ministry of Health
College of Medicine Building
16 College Road
SINGAPORE 169854

Dear Sir/Madam:

I am a PhD Candidate at Murdoch University in Western Australia undertaking research on crisis and risk communication in response to new and emerging diseases in Southeast Asia. Specifically, I am investigating the cultural, social and institutional factors that affect crisis and risk communication in this context.

In this phase of my research project I am keen to explore the methods used in managing biosecurity crisis and risk communication through literature analysis, complemented by surveys and interviews with key informants. I am hoping to engage in discussions with people from different government, non-government and international organizations who have been involved in disease emergencies (i.e. SARS outbreak) and/or who have been responsible for disease prevention and control.

I believe your office is at the forefront in responding to and managing disease emergencies, prevention and control in Singapore. I am therefore interested in finding out more about your specific involvement in and insights into improving our regional and global practices especially through crisis and risk communication management.

In this regard, I would like to request a meeting/interview with relevant staff who may be available to speak to me about disease emergency management, prevention and control. **I intend to be in Singapore between 10 and 18 January 2008. In a few days I will contact your office with further details and in order to confirm the specific day and time that I may visit.** I will also be happy to answer any specific questions you may have about the interview process.

Your support of my research project would be very much appreciated.

Yours sincerely,
Elaine Llarena
PhD candidate
Email: E.Llarena@murdoch.edu.au
Facsimile: +61 8 9310 7390

Noted:

Prof. John Edwards
Dean and Principal Research Supervisor
School of Veterinary and Biomedical Science

Appendix F

Interview guide used in the Singapore case study

I. Introduction

II. Guide Questions

1. Does the national government have guidelines/protocol/preparedness plan in place in case of an infectious disease outbreak/emergency? Briefly discuss (if documents are available, request copies) agencies involved, components of the protocol/guidelines, etc.

If there is one in place, is it linked to or based on any protocol/guidelines set up by INGOs such as the UN-WHO, FAO, OIE, etc? What is the involvement and extent of the INGOs if any? (Proceed to #s 2-3)

If there is none or one is still being developed, why do you think this is so? What are the constraints of not developing one?

In your opinion what are the key elements in managing a disease emergency crisis or outbreak effectively? (i.e. preparedness plan and implementing policies/regulations; inter-agency collaboration or linkage; public information mechanism; media management/protocol; private sector participation, role of stakeholders in responding to disease emergency or outbreaks, etc.)

2. What are the crisis communication arrangements being set up?
 - procedure
 - government institutions and NGOs involved
 - media management
 - others
3. How do those arrangements work in ensuring that the protocol or disease emergency plan is appropriately communicated to the various levels of agencies/ institutions down to the public or grassroots level?
4. What was/were the major lesson/s learned from the SAR outbreak experience (both specifically for your organisation and for the country as a nation)?
5. What was the most challenging part for: a) your organisation; b) your country - during the SARS outbreak?

III. Wrap-up/Conclusion

Appendix G

Copy of the *Adivay* 2008 - *Cañao* and Cultural Program

CAÑAO AND CULTURAL PROGRAM

November 21 - 24, 2008
Benguet Sports Center, Wangal, La Trinidad

November 21, 2008, 3:00 P.M. "CADING" / "BASE"
Arrival of Guests

November 22, 2008, 7:00 A.M. Assembly of Provincial and Municipal Representatives and Guests

PROGRAMME
8:00 A.M. - 3:00 P.M.

Invocation **Hon. Nardo B. Cayat**
Member, Sangguniang Panlalawigan and Chairman, Ecumenical Services Committee

Pambansang Awit **Ms. Regina P. Ab-abuen**

Welcome Address **Hon. Crescencio C. Pacalso**
Provincial Vice-Governor

Introduction of Guest Speaker... **Hon. Rogelio P. Leon**
Member, Sangguniang Panlalawigan

Speech.....

"AVANG" / "DEPAP" **Representative from each Municipality will catch their share of pig**

"TAYAO" **Hon. Nestor B. Fongwan and**
Mrs. Prescilla T. Fongwan

Followed by:
-National/provincial officials
-Past Provincial Officials
-Guests

"BUNONG" and "OWIK"
(Simultaneous "owik" of pigs in front of the stage by the Province and Municipalities)

TAYAOTAYAO.....TAYAO.....TAYAO

LUNCH

TAYAOTAYAO.....TAYAO.....TAYAO

ACKNOWLEDGEMENT **Hon. Nestor B. Fongwan**
Provincial Governor

MASTERS OF CEREMONY

Mr. Ernesto T. Matuday
Executive Assistant II, PGO

Hon. Florence B. Tingbaoen
SP Member

Camilo B. Alunit
Administrative Aide IV, PGSO